GENERAL LIBRARY FEB 19 1920 UNIV. OF MICHIGAN

Application pending for entry as second-class matter at the Post Office at Easton, Pa., under the Act of March 3, 1879.

AMERICAN JOURNAL OF PHARMACY

PUBLISHED MONTHLY BY THE
PHILADELPHIA COLLEGE OF PHARMACY
A RECORD OF THE PROGRESS OF PHARMACY AND THE ALLIED SCIENCES

PUBLICATION COMMITTEE
CHARLES H. LAWALL, PH.M. — GEORGE M. BERINGER, PH.M.
JOSEPH W. ENGLAND, PH.M. — JULIUS W. STURMER, PHAR.D.
JOHN K. THUM, PH.M. — E. FULLERTON COOK, PH.M.
ROBERT P. FISCHELIS, B.Sc., PHAR.D.
GEORGE M. BERINGER, A.M., PH.M., Editor

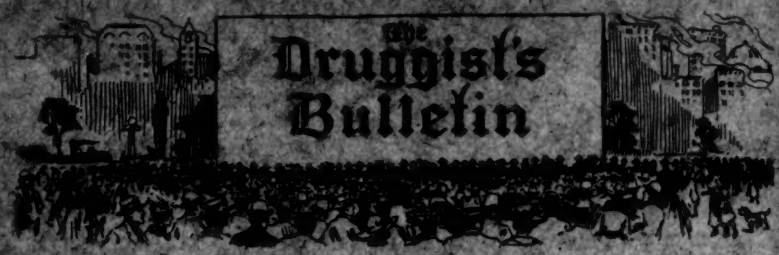
VOL. 92 — JANUARY, 1920 — No. 1

CONTENTS

Editorial
On the Threshold of 1920 1
The Bayer Company Cited to Appear before the Federal Trade Commission 3
The Revised Narcotic Regulations 4
"Proof Spirit"—What Is It? By Ralph R. Foran, P.D., Philadelphia, Pa. 11
New Therapeutic Uses for Well-known Chemicals. By E. Fullerton Cook, Ph.M., Philadelphia, Pa. 13
Denaturing of Bay Rum and Toilet Waters. By George M. Beringer, Ph.M., Camden, N. J. 17
A Review of the Advances in Pharmacy. By John K. Thum, Ph.M., Lankenau Hospital, Philadelphia, Pa. 20
Reprints: I. Journal American Medical Association 28
Report of the International Committee on Atomic Weights for 1919-20. Journal of the American Chemical Society 29
Olive Oil Situation in Italy. By A. A. Osborne, Rome 32
Gum Tragacanth. The Chemist and Druggist 33
A Modification of the Phenylhydrazine Method of Determining Pentosans. By Paul Mercuel and C. T. Dowell 39
Notes on Aluminium Plates. By Ernest H. Brittain 42
The Santonin Market. The Chemist and Druggist 45
Calcium-Creosote. The Prescriber 47
Guaiacol Iodide: An Organic Iodine Compound. The Prescriber 48
Preliminary Report on Production and Stocks of Naval Stores. Bureau of Chemistry, Washington, D. C. 49
Current Literature:
Scientific and Technical Abstracts 51
Medical and Pharmaceutical Notes 58
Correspondence:
The University of Wisconsin Desires Book Plates 62
Book Reviews:
Solubilities of Inorganic and Organic Compounds. By Atherton Seidell, Ph.D. 62
Annals of the Missouri Botanical Garden, Vol. 6 64
A Critical Revision of the Genus Eucalyptus. By J. H. Maiden, Vol. IV, Part 2. 65
Bulletins of the University of Wisconsin 66

Price, $3.00 per Annum, in advance. Issued Monthly. Single Numbers, 30 Cents. Back Numbers, 50 Cents.

Address all communications
For the Editor: To American Journal of Pharmacy, 145 North Tenth Street, Philadelphia, Pa.
For the Business Manager: To Harold J. LaWall, Business Mgr., 145 North Tenth Street, Philadelphia, Pa.
Publication Office—207 Church Street, Easton, Pa.



Pertinent Paragraphs, Quickly Read and Easily Digested

January Suggestions

Dakin's Hypochlorite Solution is difficult to make correctly—it is hard to standardize, and quickly deteriorates. Chlorazene, Dakin's water soluble antiseptic, is just as efficient, far more convenient, and less irritating than the Hypochlorites. Every druggist should have Chlorazene in stock.

One tablet of Chlorazene dissolved in ¼ to ½ glass of water is used for cuts, wounds, ulcers, and infections.

Aromatic Chlorazene Powder is recommended for gargles, nasal and throat sprays. You will hear more about this product.

When a saline laxative is prescribed, Abbott's Saline Laxative is generally the choice. You can save money, and increase your profits by ordering Abbott's Saline Laxative, packed in barrel lots. A barrel contains 1½ gross of small, or one gross of medium packages.

Increase Your Profits

Buy in bulk and in larger quantities.
Abbott products are sure sellers—you have much to gain and nothing to lose.
Special discounts are offered on quantity orders.

Bacterins

Physicians are using Abbott's Bacterins in increasing quantities. We will advertise your store as a local depot for these bacterins just as soon as a small selected stock of our best sellers is installed. Write today for details.

Influenza-Pneumococcus Combined Bacterin (Abbott No. 1195) is made after the method of Doctor Rosenow of the Mayo Foundation, for the prevention of influenza. This is a popular seller.

Increase your Profits

The demand for Abbott products has doubled in two years. Druggists now have the opportunity for special large quantity discounts which will greatly enhance their profits. Details of this special arrangement will be sent on request.

FOR YOUR CONVENIENCE

Jobbers are stocked with Abbott products

Branch Offices of The Abbott Laboratories are maintained in the following cities:
NEW YORK, 31 E. 17th St. SAN FRANCISCO, 371 Phelan Bldg. SEATTLE, 225 Central Bldg.

THE ABBOTT LABORATORIES

Home Office and Laboratories, Dept. 119, Chicago, Ill.

THE AMERICAN
JOURNAL OF PHARMACY

JANUARY, 1920

EDITORIAL.

ON THE THRESHOLD OF 1920.

"Time, as he passes us, has a Dove's wing,
Unsoil'd and swift, and of a silken sound."

By the immutable laws of the Solar System another annual cycle has been completed and we are brought to the dawn of a new calendar, another Gregorian year. Before an appreciative, broad view of the expanse before us, a very brief retrospect of the year just closed may not be amiss. We are not prepared to-day to subscribe to the sentiment that

"What's past, and what's to come, is strewn with husks,
The formless ruin of Oblivion."

The year 1919, despite the fact that it did not bring to fruition the anticipated reign of established Peace on Earth and universal Good Will among mankind, has not been lacking in actual accomplishments. Despite the fact that the demoralization of the most gigantic of all wars has been followed by a year of unprecedented social and economic disturbances and world unrest, there has been written in the historical chronicles of 1919 much that bespeaks real progress, much that is vital to the destinies of many nations and the welfare of millions of human beings. These events can never be obliterated from the records of the year nor buried in oblivion.

The wise statesmen and the thoughtful men of all civilized nations realize that the gigantic problems of this period of titanic reconstruction are necessarily being carried over to the new year and that the world's peace, prosperity and progress is dependent upon the wisdom and the justice of the decisions of these.

In matters pharmaceutic, the events of the year past have been encouraging. The conventions of the national pharmaceutical organizations of England and of America evidenced intense interest

379722

in all of the various activities that make for the progress of the profession and the papers presented and the several addresses of the presidents and the chairmen of the sections indicated the earnestness of the spirit of research and the desire for professional advancement that pervaded these meetings.

Before closing the door upon 1919, we cannot refrain from referring to some matters that are personal to the JOURNAL. Volume 91 has been completed, but not without many peculiar and trying difficulties. Those who, during this year, have been engaged in publication or had dealings with printers will appreciate the troubles of the editor in endeavoring to have the monthly numbers of the JOURNAL issued with at least some degree of regularity. At times, it would appear as if the entire printing establishment was under the control of the "printer's devil" and that his main weapon was obstruction. However, the year with its trying, yet profitable, experiences is over.

The Editor has given his best efforts to maintain the AMERICAN JOURNAL OF PHARMACY as a progressive and ethical magazine of pharmacy and appreciates the support that has been given so loyally and continuously by the contributors and subscribers and is grateful for the encouragements and kindly expressions that have come his way. It is a great satisfaction to know that the JOURNAL is not only maintaining a long established ethical standard, but that, likewise, its advertising patronage and its subscription list are both making healthy and substantial gains, that its readers are multiplying and its influence is growing apace. He takes this opportunity to once more acknowledge his indebtedness to the authors and contributors who have aided so materially in the progress.

As we view the year ahead of us, we cannot but see the dark clouds that are already above the horizon. However, we are not inclined to be pessimistic. This year will be full of opportunity for work and for prosperity such as never came to us before. With optimistic energy we must seize the opportunities as presented, and with well-defined purposes work out the salvation of sane ideals that must be established as the foundation for social, economic and scientific progress. Pharmacists everywhere must realize that they will have a share in the responsibilities and opportunities of this momentous reconstructive period. The adherence to the ethics of the profession and the degree of personal application, will determine the individual's share in the prosperity and happiness that is in store.

The Pharmacopoeial Convention to be held in Washington in May, to prepare for the Tenth Decennial Revision of the United States Pharmacopoeia, will open to the medical, pharmaceutical and chemical professions many avenues for investigation and altruistic service. This should be the opening opportunity for marking the great progress in the medical professions during the decade that has passed since the previous Pharmacopoeial Convention convened. Every pharmacist should be in alignment with and participate in the work of the revisions of the Pharmacopoeia and National Formulary that will be commenced in 1920.

To our readers and friends we extend BEST WISHES and HEARTY GREETINGS and express the hope that the year 1920 will bring to them a bounteous measure of Prosperity and Happiness.

G. M. B.

THE BAYER COMPANY CITED TO APPEAR BEFORE THE FEDERAL TRADE COMMISSION.

In the August, 1919, issue of this JOURNAL, in an editorial on the "Proprieties of Advertising," reference was made to the objectionable style of newspaper advertising employed by The Bayer Company in advertising aspirin tablets and to the action taken by the Pennsylvania Pharmaceutical Association at its annual meeting in condemnation of same.

In this editorial, comment was likewise made upon the reply of The Bayer Company to the Pennsylvania Association, admitting error in the advertisement complained of and its discontinuance was announced. We directed attention to the fact that, although this admission of error was not as frank as might be wished, it was to be hoped that under the new management of this Company the questionable methods of advertising adopted by its Hun predecessor would be discontinued and that the modern standard of business ethics and the proprieties of advertising would be observed in the future.

We have since observed that this company has continued the extensive campaign of newspaper advertisements of aspirin tablets, and that many of these contain insinuations of the inferior quality of the products of other manufacturers.

The Federal Trade Commission has taken cognizance of this unfair method of advertising and formal complaint has been made alleging unfair methods of competition and The Bayer Company has

been cited to appear before the Commission and given forty days to file an answer, after which the case may be tried upon its merits. The Federal Trade Commission allege that the published advertisements of this company imply that the word "aspirin" is only properly used to designate the product of the respondent, and that its product is the only genuine, unadulterated and safe aspirin to be used, and that the products of other manufacturers, sold in competition as aspirin, are spurious and adulterated and composed of other materials, such as talcum powder and the like. By these actions it is alleged that The Bayer Company misleads the public into giving undue preference to Bayer aspirin, thereby causing loss and damage to competitors.

The action taken by the Federal Trade Commission raises an important question as to whether such advertisements are to be included in unfair trade methods and come within the control of this Commission. We await the outcome with the hope that it will firmly establish that proper methods are to be employed in advertising that will not be unfair to either competitors or to the public and indicative of a code of ethics worthy of fair-minded business men and maintain the properties of advertising.

There is still another question involved which may not be considered at all in the cause at issue. The question of the propriety of permiscuously advertising and encouraging the indiscriminate use of a drug which has at times a deleterious action upon the human organism. This important question must sooner or later receive consideration and possibly may have to be controlled by legislative enactments. G. M. B.

THE REVISED NARCOTIC REGULATIONS.

The Treasury Department, through the Internal Revenue, has issued Regulations No. 35 relating to the importation, manufacture, production, compounding, sale, dispensing and giving away of Opium or Coca Leaves their salts, derivatives, or preparations thereof. This pamphlet of 78 pages is a comprehensive exposition of the Act of December 17, 1914, commonly called the Harrison Act and the amendments thereof enacted as sections of the Revenue Act of 1918, and of the Regulations extant for the enforcement of these laws. It is a model "Regulation" for the thoroughness and clarity with which the Department has dealt with a difficult and intricate problem and presented its conclusions and instructions.

Commendable features of this public document are the classification of the subjects as set forth in the various headlines of the chapters and paragraphs and recapitulated in the "Table of Contents," the excellent index covering ten pages of titles and giving the numbers of the articles containing information relating to each item and the very general use of cross references in the articles themselves so that related information desired is readily and promptly obtainable.

These regulations are of the greatest importance to every one whose profession or trade activities necessitates the possession and handling of opium or coca leaves or any derivative or preparation made from or containing either. They are quite explicit and settle several mooted questions that had arisen under prior promulgations of regulations and contain some modifications of former rulings and a number of new features, the literal compliance with which may cause considerable annoyance and trouble.

The various articles of the regulations are titled and numbered and printed in juxtaposition with the provisions of the law to which they are intended to apply. We fear that some of these will be considered as entirely too stringent and as exemplifying the tendency of the Departments of the Federal Government to frame regulations that are bureaucratic exhibitions of authority rather than interpretations of the enactments of Congress for the *enforcement* of which regulations are authorized. It would seem at times that the police power was exercised by the officials in charge in ways that are unnecessarily burdensome and annoying to the many who are law-abiding and at no time would intentionally infract the laws, and that time, energy and official duty could be better applied in ferreting out and punishing the relatively few who are wilfully and criminally breaking the laws.

The purpose to have Federal and State enactments so dovetail as to prevent those who are not properly qualified from engaging in dealing in narcotic drugs is a fundamental principle to be observed. Very rightly an initial requirement is that only those whose dealings in narcotic drugs are not in violation of any law, either State or Federal, can be licensed under this law and that the application for registration must be accompanied by affidavit showing that the applicant is legally qualified or permitted, under the laws of the jurisdiction in which he is engaged, or proposes to engage, in any business or occupation within the scope of these regulations, to engage in such business or occupation.

Registrants under this Act should be careful to see that they carry on their business in these drugs in strict accordance with the classifications of the law and the differentiations of what can be actually done under each class. "A Retailer" cannot engage in the sale of original stamped packages of these drugs unless he likewise is registered as a wholesale dealer and pays the annual tax of $12.0 imposed upon those so classified. Nor can a "Retailer" or a "Wholesale Dealer" engage in the manufacture and sale of non-exempted articles such as Laudanum and Dover's Powder without also registering under Class 1—Importers, Manufacturers, Producers, Compounders. As a consequence those engaged in a complex business, or who supply physicians and hospitals, for example, will have to be registered under several classifications and keep the required records for each. While a "Wholesale Dealer" under the definition of the Act may sell stamped full packages of other manufacture than his own, when he sells his own products of these narcotic drugs, he must do so as a licensed "Manufacturer" and stamp tax these at the specified rate of 1 cent for each ounce or fraction thereof of the *preparation* and not the narcotic contained.

Attention is especially called to the classification of chemists, who are not employees of a registered manufacturer, but who make analyses of narcotic drugs or preparations or use such in the analysis of other things, as liable to the tax as compounders of $24.00 per year. They must procure the narcotic drugs to be used as test reagents in their analytical work on official order forms and keep records and make the same form of returns as do the manufacturers. This may be very unwelcome to the majority of chemists who but very seldom engage in such analyses or to the toxicologist who may unexpectedly be called into a case requiring such reagents to confirm his findings.

Practitioners who prescribe narcotic drugs must register and pay the tax of $3.00 per annum even though they do not keep such drugs in their possession. A practitioner may sell to his *own bona-fide patients* narcotic drugs for legitimate medical purposes without incurring liability as a retailer.

Institutions, such as colleges of pharmacy, sanatoriums, clinics and hospitals not exempt as federal, state, county or municipal public institutions must pay the same tax as individuals similarly engaged in handling narcotics.

Itinerant vending or peddling is precluded as all sales and dis-

pensing must be done from a fixed address and a peddler of such drugs will be regarded as incurring a separate tax liability and committing an additional offense at each place where a sale is made. Even the exempted preparations may be sold only at or from registered places of business. This should eliminate the evil of the wagon peddler selling promiscuously paregoric and exempted proprietaries to the grocers and general store keepers who are irresponsible and usually not qualified by the laws of the state to engage in such trade.

Nurses are not permitted to register nor to be in possession of narcotics except as agents of physicians or those prescribed as medicines for their personal needs and they are subject to the same limitations as other consumers. A practitioner must account on his records for all narcotics left with nurses for administration and all such as are not administered must be returned to him.

While officials of national, state, county or municipal hospitals or public institutions, who in the discharge of official duties have to dispense or handle narcotics, are exempt from registration and the payment of the special tax imposed upon registrants, they must have the orders on which they secure the supplies of narcotics approved by the collector of the district and as a prerequisite satisfactory credentials of the exemption and official capacity of the official must be filed annually before July 1st. The exemption granted does not relieve them of the necessity of keeping the required narcotic records.

Ample provisions are made for change of address, change of ownership for any cause, and the mode of procedure in such cases is prescribed.

The forms for records and reports for each class of registrants are specified. The required records are exacting and the keeping thereof will entail much labor and may prove nigh impossible to the busy practitioner or dispenser. The reports are to be made out monthly and in triplicate, and exhibit all receipts of narcotics and their disposition and stock in hand.

Instructions are given for the cancellation and application of the special narcotic stamps to be applied by importers and manufacturers and the reports required provide for an accounting of all stamps purchased, used and unused.

The practicability as well as the wisdom of the requirement that narcotic drugs and preparations must at all times be segregated and be kept under lock and key, is questioned. While such a method may be readily practiced by a practitioner whose stock should be

relatively small and require but limited space, it will not be easy to follow by the druggists and manufacturers whose varied stocks and the ample supplies required would necessitate a large space, special compartments or rooms and each must be under lock and key. It will destroy the orderly classification and arrangement of stocks and moreover the segregation will advise the dope fiend and the thief where such valuable and narcotic drugs and medicines are stored.

Physicians and pharmacists want to bear in mind that official orders are to be issued for the purchase and transfer of narcotics and that duplicates must be made out at the time of executing the originals. Further, that they are to be used to cover each and every transfer of narcotics between those registered under the act, but they *must not in any case be used as prescriptions.* The order issued must specify the number and size of package of each item and if pills, tablets or other similar dosage forms, the number of such units in each individual package. The prior regulations are modified so as to permit a person licensed under several classifications to transfer on his records from one registry to another without the issuing of orders against himself, but his records must show every such transaction. Unfilled orders should be returned to the maker with a letter of explanation and this letter with the returned order is to be filed as part of his records. On orders filled in part only, the vender and likewise the vendee shall note on the order and duplicate the actual quantities supplied with date, and subsequent deliveries on account must also be noted on these orders.

Prescriptions can be issued for narcotics, only by practitioners duly registered under the act and can be filled only by pharmacists also registered under the proper classification. The regulations concerning prescriptions are necessarily exacting and must be carefully studied and followed by dispensers. A prescription can only be *issued for legitimate medical purposes. It cannot be issued as an order for the practitioner to purchase his supplies nor for the purpose of supplying addicts with narcotics.* The prescription *must be written with ink or indelible pencil or typewritten;* if typewritten, *it must be signed by the practitioner with ink or indelible pencil.* This may conflict with the custom in some dispensaries and clinics to have certain frequently-used prescriptions printed and with the not uncommon practice among physicians to use the ordinary lead pencil in writing prescriptions and not the indelible type now officially directed. The prescription *must be dated and signed the day of issuing*

and must bear the full name and address of the patient, the name, address and registry number of the practitioner. The responsibility for the proper writing of the prescription is upon the practitioner and he is liable to the penalties provided if he fails to insert thereon the information required by the law.

Physicians who have occasion to treat incurable diseases such as cancer and advanced tuberculosis where narcotics are necessarily prescribed in relatively large quantities, or who are attending aged and infirm addicts, the withdrawal of the drug from whom would result in death, are permitted to prescribe the narcotics needed in accordance with their judgment, provided endorsement is made upon the prescription that the drug is dispensed for the condition stated, and in the latter case give the age of the patient and state that the drug is necessary to sustain life.

The druggist filling the prescription must show on the back thereof the *signature and address of the person who secures the drug prescribed* and must *preserve the prescription for a period of two years.*

The *refilling* of a narcotic prescription is *prohibited,* except where the preparation covered by the prescription might have lawfully been sold in the first instance without a prescription or official order.

The permission to refill prescriptions for exempted drugs and preparations is a distinct modification of the previous regulations which differentiated between "prescription" and "preparation" and the selling of exempted drugs as either. *Partial filling of prescriptions will not be permitted under any circumstances, nor can prescriptions for narcotics be accepted over the telephone.* This provision will conflict with the custom of many physicians to telephone their prescriptions to the pharmacists.

The *order forms* supplied for the purchase and transfer of narcotics *must not be used as prescriptions.* The pharmacist filling the prescription must *affix to the package a label showing the name and registered number of the dealer, the serial number of the prescription and name and address of the patient and the name and address and registered number of the practitioner writing the prescription.* As containers frequently used for prescriptions will not be large enough to permit a label giving directions and also the additional data required by this regulation, it may be necessary to attach to the package a special label containing the data directed.

The collector of literary curios will find a number of these in the recent Congressional enactments and in regulations framed by the

departments. The following *bon mot* is a sample worthy of such preservation. "A practitioner is not regarded as in personal attendance upon a patient in the intent of the statute unless he is in personal attendance upon such patient away from his office."

"Personal attendance" should be irrespective of the temporary place of either physician or patient and the necessity of the patient should determine the drug prescribed by the physician and not the fact that the patient happens to be in the physician's office.

Only such narcotic drugs as are personally administered by a practitioner when in attendance upon a patient away from his office are exempted from the records of narcotic drugs required.

Stock solutions such as are used by oculists and other specialists may be kept on hand, providing a record is made of the date when the solution is made or purchased and the date when such solution is exhausted.

All records made by any of the registrants must be kept open for the inspection of authorized officials of the department.

The regulations provide that oral, nasal, ocular, rectal, urethral and vaginal preparations are not to be regarded as for external use, and that preparations manufactured or used for such purposes containing more than the exempted amount of narcotic drugs do not fall within the scope of the exemption granted to external preparations.

A private formula containing not more than the exempted percentage of narcotic drugs, made in accordance with a private formula of a physician, upon request of the physician that the druggist keep a quantity of the mixture on hand in order that prescriptions may be filled for his "special mixture" is not to be considered as a ready-made preparation in accordance with the U. S. P. or N. F. or established formula, and is, therefore not within the exemption granted for such preparations.

Every manufacturer, producer, compounder or vender (including the dispensing physician) of exempted preparations, must keep a record of all sales, exchanges, gifts, etc., the entries to be made at the time of delivery. The record must show the name, address and registry number of the dealer to whom the preparation or remedy is sold, exchanged or given, the name and quantity of the preparation or remedy, and the date on which the delivery to the purchaser or his agent is made. A separate record must also be kept of sales of such exempted preparations to persons other than dealers, even

though such sales are made on prescriptions. It is probable that many druggists have not heretofore kept such record of the sales of exempted preparations and proprietaries, and they should take cognizance of the requirement of the law that such should be kept and the intent to enforce same as shown by the regulations.

G. M. B.

"PROOF SPIRIT"—WHAT IS IT?

By Ralph R. Foran, P.D.,

PHILADELPHIA, PA.

The term "proof spirit" is one of British origin, American adoption and universal confusion. In Allen's "Commercial Organic Analysis," 4th edition, we are told that "formerly the British Excise determined the strength of spirits by pouring a certain amount on gunpowder. A light was then applied. If the spirit was above a certain strength ('proof') the gunpowder ultimately inflamed, but if weaker the gunpowder was too much moistened by the water to be capable of explosion, and the sample was said to be 'under proof.'" Fortunately, this archaic method of approximating the alcoholic strength of spirits is no longer used, and by Act of Parliament, "proof spirit" is now defined to be a liquid of such density that, at 51° Fahrenheit, thirteen (13) volumes shall weigh the same as twelve (12) volumes of water at the same temperature. The "proof spirit" thus produced has a specific gravity of 0.91984 at 60/60° Fahrenheit, and contains, according to Fownes, 49.24 per cent. by weight or 57.06 per cent. by volume of alcohol.

The United States Internal Revenue Department defines "proof spirit" as "that alcoholic liquor which contains one-half its volume of alcohol of a specific gravity of seven thousand nine hundred and thirty-nine ten-thousandths (0.7939) at 60° Fahrenheit." "This will correspond to a specific gravity of about 0.9341 if water at 60° Fahrenheit be taken as unity and to a content of 42.7 per cent. by weight of absolute alcohol. Absolute alcohol would contain 200 per cent. of 'proof spirit' according to the United States system, instead of 175.25 per cent. in the English system."

This difference between the British and United States standards has served to bring about a pronounced confusion in the definition

of "proof spirit," and a survey of a number of text and reference books on pharmacy and the allied sciences has disclosed much misinformation on the subject.

Simon's "Manual of Chemistry," 11th edition, 1916, describes "proof spirit" of the United States Custom House and Internal Revenue Service as being identical with diluted alcohol U. S. P. Neither the diluted alcohol of the ninth revision nor that of any of the preceding revisions which were consulted is of "proof spirit" strength.

Wilcox's "Materia Medica and Therapeutics," 10th edition, and Culbreth's "Materia Medica and Pharmacology," 6th edition, 1917, also err in giving "proof spirit" as a synonym for Alcohol Dilutum U. S. P.

Remington's "Practice of Pharmacy," 6th edition, 1917, is authority for the statement that "United States proof spirit differs from diluted alcohol and is stronger; it contains 50 per cent. (or, more exactly, 49.5 per cent.) by weight of absolute alcohol." Surely this misstatement, in a book which is so widely read and quoted, will be corrected in the next edition.

Sadtler and Coblentz, in "Pharmaceutical and Medical Chemistry," 4th edition, 1918, have in mind the British standard and say that "proof spirit" has a specific gravity of 0.9198 at 15.5° C., and according to Fownes contains 49.24 per cent. by weight of alcohol."

In Leffmann and LaWall's "Organic Chemistry," 1904, "proof spirit" is defined as containing, by weight, "50.8 parts of absolute alcohol to 49.2 parts of water and has a specific gravity of 0.920." This would be correct for the British standard, were it not for the fact that the quantities of alcohol and water are transposed.

The most glaring misinformation on the subject is found in Gould's "Medical Dictionary." The 4th edition defines "proof spirit" as "any liquor containing at least 49 per cent. of absolute alcohol." In the 10th edition, 1917, matters are made worse by definition under two headings:

> "Proof spirit—Alcohol containing 42.5 to 49.24 per cent. of absolute alcohol," and
>
> "Spirit, proof—Dilute alcohol with 40 to 50 per cent. of pure alcohol."

Dorland, in his "American Pocket Medical Dictionary," 11th edition, 1919, uses these two definitions verbatim and is thereby guilty of perpetuating the fallacy.

Naturally, the majority of text and reference books have defined "proof spirit" properly. Where the subject has been elaborately treated, the suggestion is made that the term "proof spirit" be abandoned as being unscientific. This is a very proper and timely suggestion, and especially so, inasmuch as the coming era of prohibition will lessen the amount of spirits to be gauged. Whiskey, the liquid for which the gunpowder or "proof" test was originally devised, has fallen into disrepute and with it should go the term "proof spirit."

Finally, "proof spirit" is correctly defined as containing 50 per cent. by volume of absolute alcohol. This corresponds to 42.7 per cent. by weight. It has a specific gravity of 0.9341 at 60° Fahrenheit.

CHEMICAL LABORATORY,
PHILADELPHIA COLLEGE OF PHARMACY,
NOVEMBER 24, 1919.

NEW THERAPEUTIC USES FOR WELL-KNOWN CHEMICALS.

BY E. FULLERTON COOK, PH.M.,

PHILADELPHIA, PA.

Benzyl Benzoate.—In an extensive study of the action of opium alkaloids, David I. Macht, M.D., of the Medical Department of Johns Hopkins University, has demonstrated that these alkaloids divide into two classes, of which morphine is the most important of those belonging to the pyridin-phenanthrene group and papaverine, the principal representative of the benzyl-isoquinoline group.

The morphine group, including codeine, or methyl-morphine, dionine or ethyl-morphine, heroin or diacetyl-morphine, apomorphine, apocodeine, eucodine or methyl-codeine, peracodine or dihydrocodeine, and codeonal or codeine diethyl-barbiturate, all tend to stimulate the contractions and heighten the tonus of smooth muscles, but papaverine, or its related alkaloids, narcotine, narceine, and hydrastine, all produce an inhibition of the contractions of smooth muscles and lower their tonus.

He also fully proves that this action of the papaverine group was due to the benzyl portion of the molecule and this led to an effort

to find a non-narcotic benzyl combination which would produce similar therapeutic action and resulted in the discovery that the esters, benzyl acetate and benzyl benzoate, possessed such properties.

This was first shown by experiments upon animals and subsequently by many clinical tests and has led to the suggested use of the latter where antispasmodic action upon the smooth muscles is desired.

It was found that while the acetate was of equal therapeutic value it produced slight irritation upon the stomach and the benzoate has therefore been recommended for general trial. It is employed in dysentery, biliary, renal and uterine colic, in arterial spasms, bronchial spasms, as in asthma, in dysmenorrhoea and other excessive spasms of smooth muscles.

Benzyl benzoate has long been used as a solvent in perfumery, especially for synthetic musk, and also for the incorporation and fixing of the flavor in chewing gum, where it prevents loss by evaporation during the heating and kneading of the mass, and it is interesting to learn that its therapeutic value was suggested by chemical and physiological experiments, conducted in a modern research laboratory, whereby the value of such work is again conclusively demonstrated.

Pharmaceutically, benzyl benzoate must be treated very much like an oil. Its dose is small, 2 to 5 minims, and it has been most largely administered in 20 per cent. alcoholic solution containing 2 per cent. of soap which makes a solution that is readily miscible with water. It has also been dissolved in fixed oil and dispensed in capsules. Dr. Litzenberg (*J. A. M. A.*, 73: 601, 1919) suggests the following prescription for its administration for dysmenorrhoea.

℞.

Benzyl Benzoate	10 mils
Mucilago Acaciae	5 mils
Elix. Eriodicty. Aromat. *q. s.*	50 mils

Give from one-half to two teaspoonfuls as necessary. In the *J. A. M. A.*, 73: 599 and 601, a more extensive review and many additional references may be found.

Benzyl Alcohol (*Phenmethylol*).—During experimental work on benzyl combinations, in the study of their antispasmodic action,

Dr. David I. Macht (Pharmacologic Laboratory of Johns Hopkins University) incidentally tasted a minute quantity of benzyl alcohol and discovered that his tongue was completely anesthetized by it, the numbness, coolness and hardness, similar to the action of cocaine, continuing for over two hours.

This accidental discovery was followed by numerous experiments on animals and subsequently in minor operations and dentistry, with results that compare favorably with any of the known local anesthetics and in some respects greatly to the advantage of the benzyl alcohol.

Fortunately, benzyl alcohol is soluble in water and normal salt solution to the extent of 4 per cent. and this is sufficiently strong for use as a local anesthetic by injection. When used as an anesthetic in from 1 to 4 per cent. solutions in normal salt, it has never been found to cause any marked irritation or destruction of tissue, certainly less than that produced by equivalent amounts of cocaine or quinine and urea hydrochloride solutions.

The solutions may be sterilized by boiling without causing decomposition or loss of benzyl alcohol. When used on the eye it was found desirable to add a small amount of epinephrin (1 in 20,000), thus avoiding all irritation. A comprehensive study of its anesthetic and pharmacologic action will be found in the *Journal of Pharmacology and Experimental Therapeutics*, 1918, p. 263.

Solution of Zinc Chloride.—William Wayne Babcock, Lieutenant-Colonel in the Medical Corps of the United States Army, stationed at General Hospital No. 6, Fort McPherson, Georgia, has recently reported the successful use of solution of zinc chloride (prepared by saturating U. S. P. hydrochloric acid with zinc) in the treatment of chronic infected wounds of soft tissue and also of bone involvement.

The patients were all returned from the war areas and had already received months of treatment, usually with Dakin's Solution, and had been operated upon at least several times. The wounds showed a variety of infecting micro-organisms, and the solution of zinc chloride was used as a sterilizing agent, the tissue, which it simultaneously destroyed, being completely removed as a part of the operation. This procedure permitted the immediate closing of wounds, the avoiding of painful dressings, and a large percentage of permanent recoveries.

The technique is as follows, the operation being conducted under local or general anesthesia:

Wound Preparation.—The wound areas having previously been thoroughly cleansed by daily washing and shaving, the skin is thoroughly scrubbed with a solution consisting of 2 parts of compound solution of cresol, 10 parts of oil of turpentine and 88 parts of gasoline, and then painted with 3 per cent. tincture of iodine.

Wound Sterilization.—Immediately after the cleansing, the sinuses, cavities and wound surfaces are sterilized by the use of the solution of zinc chloride, injecting it under pressure, or packing with cotton pledgets dipped in the solution, and great care is taken to see that all unhealed and granulating surfaces are reached.

Five minutes is allowed for the penetration of the zinc solution, and if it has been injected, under pressure, into bone sinuses, a tourniquet must be applied and the solution allowed to enter the circulation only slowly, otherwise collapse will result. Because of the caustic character of this solution and the danger of direct introduction into the circulation it cannot be used in fistulas connected with the bladder, or intestine, nor can it be used in the presence of erysipelas, or other acute spreading infection.

Color Dilineation.—At the end of five minutes, the following solution is applied, in the same manner as the zinc chloride solution:

Saturated Alcoholic Solution of Methylene Blue	20
Potassium Hydroxide	3
Phenol	5
Ether, sufficient to make	100

When this solution evaporates it leaves the exposed granular surfaces dark blue-black, dry, bloodless on manipulation, and sterile, and beneath a grayish white tissue which has been sterilized and devitalized by the zinc chloride.

Excision of Infected Area.—The entire diseased area is now removed, the wound closed, and a moist, non-irritating, antiseptic dressing applied for the first week, or until all tissue reaction has subsided. The solution used consists of:

Hydrated Chloral	1
Alcohol	10
Glycerin	25
Saturated Solution of Boric Acid	65

This is injected into the gauze dressings every two or four hours by means of rubber tubes which are inserted when the dressing is applied.

The part where the operation occurred should be kept quiet, elevated and warm, and there should be no probing, squeezing, or introduction of tubes. The dressings should be changed daily and the adjacent skin must be kept clean and coated with a 2 per cent. yellow mercuric oxide ointment.

NOTE.—The details of this treatment and the formulas have been taken from a report on the subject read by Dr. Babcock at the recent meeting of the A. M. A. but not yet published.

DENATURING OF BAY RUM AND TOILET WATERS.

BY GEORGE M. BERINGER.

At the conference in Washington on December first, between the Prohibition Commissioner and members of the Technical Staff of the Bureau of Internal Revenue and the manufacturers of perfumery, toilet articles and barber supplies, it developed that the Department had made up its mind that bay rum and toilet waters made with non-beverage alcohol hereafter must be denatured by the addition of some modifying substance that would render these toilet articles unfit for beverage purposes.

Chief Chemist Adams, of the Bureau, stated that the Department was favorably considering a requirement that one-fourth grain of tartar emetic must be added to each fluid ounce of bay rum and toilet waters. The opinion of the Department as to the feasibility and safety of the use of tartar emetic as a denaturing substance was based upon a few days' trial in a way that could not be at all considered as worthy of the designation of a scientific investigation. No effort has been made to determine whether absorption followed the external application of bay rum so medicated or whether there was any evidence of the poison having entered the system or of its elimination through the secretions.

The technical experts present were unanimous in their objections to the use of tartar emetic and pointed out its toxic action and the danger of poisoning either through accidental or intentional consumption as a beverage.

It is to be regretted that in the face of this information and with

only such a scant investigation the Department should persist in further advocating the addition of tartar emetic in this quantity as a modifying agent for this class of toilet preparations.

We note a published statement that the Department has decided that "No application to use non-beverage alcohol in the manufacture of bay rum without regard to alcoholic content, or of toilet waters containing less than 50 per cent. of alcohol, will be approved by the Internal Revenue Bureau, after January 16, 1920, unless same are modified by the addition either of one-fourth grain of tartar emetic to the fluid ounce or a satisfactory quantity of some other modifying agent to be suggested by the manufacturer, who in presenting the suggestion to the Bureau, shall submit sufficient data to satisfy the officials of its efficiency. The requirement placing the burden upon the manufacturer to make the necessary tests of the modifying agents proposed as alternatives is made necessary because of the small technical staff at the disposal of the Bureau."

For more than three hundred and fifty years antimony has been recognized as a poisonous metal, and all its salts as active poisons. Its close relation chemically to arsenic and the analogy between the symptoms produced by arsenic and antimony have long been recognized. It is not safe to rely upon the probability of emesis to eliminate tartar emetic, as it is a well-known fact that at times there may be a complete absence of vomiting or only a slight nausea, but the toxic action of the drug may later be exhibited in other ways than by vomiting and diarrhea. Paralysis as well as direct action on the heart and respiration and convulsions are among the symptoms that have been recognized, even from moderately small doses, and as little as one-third of a grain is recorded as having caused death. Even when applied externally it has been known to produce local irritation and pustular eruptions.

It is not improbable that the continuous external application of a toilet water so medicated may produce chronic antimonial poisoning, nor is it at all certain that such use would not have a deleterious action upon the hair as well as the skin.

It is inexplicable that, in the light of recent experience and the numerous deaths resulting from the use of poisoned whiskey substitutes, a department of the government should propose the use of such a toxic agent for the denaturing of toilet waters for the purpose of preventing their possible consumption for alcoholic beverages.

At the conference of the technical experts present in Washington a number of materials were discussed as possible modifying agents for this class of preparations. Among those mentioned were the chlorides of zinc and cadmium. Objections were made to the use of these mineral salts upon the ground that they would possibly act upon and modify the perfume constituents, and also cause precipitates in the preparations, and there was likewise an uncertainty as to the toxicity of these salts.

Saccharin in relatively large quantities was suggested as a modifying agent. The extreme, disagreeable sweetness and acridity that this would produce would possibly render such medicated bay rum or toilet water unfit for beverage purposes, but the persistent sweetness produced when applied to the face and lips would be objectionable and render the product unfit for its legitimate use.

Formaldehyde was another of the possible agents considered, but objection was made as to the possibility of this having a deleterious action upon the perfume oils and chemicals of the formulas.

Salicylic acid was another suggestion that did not meet with a cordial reception because of its proneness to react with other chemicals and to undergo change and possible darkening in solution.

Phenolphthalein was suggested by someone, but its well-known color reactions with alkalies preclude serious consideration. After shaving or washing with soap the application of a toilet water so medicated would produce a distinct purple or red discoloration of the skin as well as staining towels and clothing to which it might be applied.

Among vegetable drugs possibly useful as denaturants, soap bark and colocynth are worthy of consideration; the latter especially appears to give satisfactory results from our experiments. In the proportion of two grains to the fluid ounce it renders the filtered bay rum sufficiently disagreeable and unpleasant to render it unfit for beverage purposes and does not appear to affect injuriously either the color or odor of the preparation. It would appear as likely to serve as a suitable modifying or denaturing agent for perfumes and alcoholic liquid toilet preparations.

A REVIEW OF THE ADVANCES IN PHARMACY.

By John K. Thum, Ph.M.,

THE LANKENAU HOSPITAL, PHILADELPHIA.

THE ACTIVITY OF AMERICAN DIGITALIS.—J. H. Pratt and H. Morrison, of Boston, both doctors, had their attention called to the possibility of using American digitalis as early as 1910, when a tincture made from leaf grown in the Rocky Mountains was found, in their laboratory, to be nearly twice as strong as the tincture in use at that time in the Massachusetts General Hospital. This tincture was prepared by a prominent American manufacturing pharmaceutical house in January, 1909; and as it was not tested until December, 1910, it was probably two years old and had probably lost some of its original potency.

The authors mention that Duffield, in the AMERICAN JOURNAL OF PHARMACY, 41: 55, 1869, speaks of tests that he had made of American-grown digitalis, prepared by the Shakers of Mount Lebanon. By crude chemical methods he found that the percentages of active principles were higher than in samples of English leaf, and these in turn higher than in German leaves that he examined at the same time. He said that our home-grown digitalis, if properly dried and gathered, was superior. Unfortunately, his investigation led no one to study and report the therapeutic value of the American digitalis leaf.

In 1911, Dr. Hale published the result of some of his work which shows that first-year leaves from American leaves from Arlington, Va., and those grown in Madison, Wis., and Seattle, Wash., were stronger than the select English leaves that he tested at the same time for comparison. He also found that second-year leaves grown in Seattle were somewhat weaker than the English digitalis.

Rowntree and Macht (*Jour. A. M. A.*, 66: 870, 1916), using the cat method of Hatcher and Brody, made the discovery that digitalis from the drug garden of the University of Wisconsin was more active than any of four lots of Allen's English leaves tested. Some of this same lot of Wisconsin leaf was tested by Dr. Pratt, a 10 per cent. infusion being used. The Minimum Lethal Dose of this infusion was 0.012 Mil. per gram frog weight. Dr. Pratt states that this was stronger than the majority of English and German leaves examined in his laboratory. Roth tested some American-grown

digitalis and obtained results that compare favorably with that of any grown anywhere else. He believes that the wild digitalis which is found in the Northwestern States may be utilized as a source of supply for making the various preparations of digitalis and that by using ordinary methods in handling and preparing the leaves a highly active product may be secured, one that would compare favorably with the activity of cultivated leaves grown under more favorable conditions.

In their experimental work Drs. Pratt and Morrison used the one-hour frog method recommended by the United States Pharmacopœia. In one series twenty-two frogs were required to determine with sufficient accuracy the minimal dose required to produce systolic standstill. The temperature of the water in which the frogs were kept before and during the experiment was carefully regulated, and the temperature of the air in the room was noted and recorded. Twenty-eight samples of American-grown digitalis were tested. It is believed that differences in strength in leaves grown in different localities is due to soil and climate. Digitalis does not grow well on limestone lands. This was noticed by Lloyd when he tried to cultivate the leaf in Kentucky. It is generally found in profusion on land containing iron and manganese. Digitalis does not grow in Switzerland and it is attributed to lack of iron and manganese in the soil. The authors conclude that the best American digitalis, both wild and cultivated, is equal in activity to the best European digitalis. They are also strongly of the opinion that all digitalis should be tested biologically before it is gathered in large quantities for medicinal use.—*Jour. A. M. A.*, 73: 1606, 1919.

A Clinical Study on the Use of Calomel Inunctions.—Mercury inunction has been used for the treatment of syphilis ever since the beginning of recorded medical history, and always in the form of an ointment made with the metallic mercury. There has always been objections to its use, however, by fastidious persons, and justly so, on account of its uncleanliness, its betrayal of what the patient is suffering from, and the frequency with which it sets up irritation of the skin. These points have been often dilated upon. Recently, Wile and Elliott and Schamberg, Kolmer, Raiziss and Gavron have suggested the use of calomel. Their reason for advocating its use is that it overcomes the foregoing objectionable features of blue ointment. As calomel is more cleanly, and as they

felt that it is as easily absorbed through the skin as the ordinary blue ointment, they advised that it be used for inunction purposes and advanced a formula consisting of:

Hydrargyri chloridi mitis	3.00 Gm.
Lanolini	1.00 Gm.
Adipis benzoinati	2.00 Gm.

The arguments of the above authors as to its absorbability seemed so convincing that Cole and Littman, of Cleveland, began to use it in their private practice. This was in the spring of 1917. Since then the use of calomel has become so popular that a manufacturing house has brought out an ointment of calomel which is a little more pleasant than the ordinary preparation, though probably no more efficient. After using this for some time Cole and Littman began to feel that it was not doing what was expected of it. For one thing, the patients never became salivated with it, which struck them as significant. They also noticed that many times patients did not react to this treatment as they had to blue ointment inunctions or injections of mercury. These results, or lack of results, led them to carry out a series of tests in a scientific manner to determine the efficacy of calomel inunctions. Fresh clinical syphilis in the venereal wards of the Cleveland City Hospital was used for the demonstrations. Tests on fifty-four cases were carried out in as unprejudiced manner as possible. The investigation was undertaken at the suggestion of the Therapeutic Research Committee of the Council on Pharmacy and Chemistry of the American Medical Association.

The cases were carefully watched: routine Wassermann tests on the blood, *Spirochæta pallida* examinations and spinal fluid examinations were made in every case. Care was taken in all instances in using the ointments that patients were always under the observation of an orderly or of a nurse to see that the inunction was rubbed in through a space of at least thirty minutes for six nights in each week, with a hot bath on the seventh night, and without other medication. In nearly all the cases the calomel ointment described above was used, it having been prepared by the hospital pharmacist. In a few cases a proprietary calomel ointment was used. It was often difficult to keep the patients under this treatment as long as the investigators would desire as some of them noticed that they did not improve under this manner of treatment. To quiet them they were given saline injection as a placebo so that they would be under

the impression that they were receiving arsphenamin medication in conjunction with the inunctions.

An analysis of the results show that there was practically never any improvement in primary lesions when these inunctions were used. The lack of salivation was in startling contrast to results after the use of the old reliable blue ointment. They conclude that calomel inunctions are almost completely inefficient against primary and secondary syphilis. Furthermore, such inunctions very rarely produce salivation or gingivitis. This means poor absorption and explains its clinical inefficiency. The calomel also produces dermatitis. The investigators strongly urge the discontinuance of the use of calomel ointment for the treatment of syphilis.—*Jour. A. M. A.*, p. 1408, 1919.

A NEW GERMICIDE FOR USE IN THE GENITO-URINARY TRACT: "MERCUROCHROME, 220."—Drs. Young, White and Swartz, of the Brady Urological Institute of Baltimore, have been making a study of antiseptics with the end in view of discovering something particularly applicable to the genito-urinary tract. Noting the results of the use of the flavines in the treatment of venereal diseases they became impressed with the possibilities of using dyes as a basis for the development of germicidal and therapeutic compounds, their object being to obtain drugs that would possess the penetrating qualities of dyes and at the same time be destructive to germs and comparatively non-toxic and non-irritating. This research resulted in a number of compounds and from among them the substance mentioned above was selected for extensive study. In "Mercurochrome, 220," the investigators assert they have evolved a drug of demonstrated germicidal value. The rapidity with which some old infections of the bladder, kidney and pelvis have been cleared up after its use is striking, and they lay special stress on its absence of irritating and toxic qualities, and the ease with which the patient may retain a one per cent. solution for hours without discomfort. This, they say, is more than sufficient to establish the possibilities of the drug in these conditions. They state this is the first time that a drug has been developed having great germicidal strength and which can be borne or tolerated in the human bladder for several hours. This is an ideal which has long been striven after. In synthesizing this drug they had in mind the production of one that would have the following properties: (1) Ready penetration of the

tissues in which the infection exists; (2) lack of irritation of the drug to tissues; (3) high germicidal activity; (4) ready solubility in water and stability of the solution; (5) freedom from precipitation in urine; (6) sufficiently low toxicity to avoid systematic effects from the small amount of the drug that may be absorbed.

Mercurochrome is obtained by substituting one atom of mercury in the molecule of dibromfluorescein. Chemically it is dibromoxymercuryfluorescein, or its sodium salt. It contains about 26 per cent. of mercury. The free acid is a red powder insoluble in water but readily soluble in sodium hydroxid solution, with the formation of a deep cherry-red color. Its solutions show fluorescence on dilution. The dry salt forms iridescent green scales, slightly hygroscopic and readily soluble in water. The solution is stable and is not affected by moderate heat or exposure to the air. Strongly acid urine gives a slight precipitate of the free dye. There is entire freedom from precipitation when a one per cent. solution of the drug is mixed with an equal volume of medium rich in protein such as hydrocele fluid. The solution stains the skin a bright red color, but this can be removed by rubbing first with a 2 per cent. solution of potassium permanganate, and then with a 2 per cent. solution of oxalic acid. In actual practice it has been found that this tendency to stain is annoying to patients in that extraordinary care must be taken in regard to underclothing, sheets and toweling, as it is impossible to remove the stains. A 1 : 1000 solution of the drug will kill *B. coli* and *Staphylococcus aureous* in urine in one minute. It has practically 50 times the germicidal strength of acriflavine in urine medium for exposures of one hour. Solutions of one per cent. can be held in the human bladder for from one to three hours without irritation. The drug has proved to be of great value in the treatment of chancroids and as a dressing after incision of buboes. It promises to be of great value in the treatment of gonorrhea. Its use in chronic affections of the bladder gave remarkable results, purulent cystitis disappearing in a surprising manner with freedom of pus and bacteria in a few days.—*Jour. A. M. A.*, Vol. 73, No. 20, 1919.

Fixed Oil of Fenugreek.—Besides an essential oil, fenugreek seeds contain about 7 per cent. of a fatty oil, color golden, and with a characteristic unpleasant smell and taste. Its specific gravity is 0.9471 at 15° C., saponification value 189.5, and iodine value 132.8.

According to the investigator this oil contains 6.25 per cent. of lecithin and 0.5 per cent. of phytosterins. The fatty acids are mainly linoleic and oleic acids, and 1.5 per cent. of volatile fatty acids. It was noticed that when the oil is spread in a thin layer and exposed to the air, it quickly dries to a golden yellow, transparent varnish, which is insoluble in ether. Therefore, it rightfully belongs to the class of drying oils.—H. E. Wunchendorff, *J. pharm. chim.*, 1919; through *The Pharm. Jour. and Pharmacist*, Aug. 16, 1919.

Benzoic Acid from Cows' Urine.—No doubt due to the unsettled and chaotic conditions brought about by the Great War, an old source of benzoic acid has recently again been made use of. Since the discovery of the possibility of making this acid synthetically from toluol, the natural source does not appear to have been very much encouraged and rightly so as cost of production is a very important factor in manufacturing. However, it has been suggested by the authors of this paper that its manufacture is still commercially feasible in Canada. They found that hippuric acid equivalent to one pound of benzoic acid per diem is obtainable from fifteen cows. The urine is acidified with hydrochloric acid and cooled to 0° C., when the hippuric acid crystallizes out. They believe this process could be profitably worked out in winter by Canadian dairy farmers. —P. J. Moloney and F. T. Shutt, *Trans. Roy. Soc.*, Canada, 1918–1919, 31, 12 (3), 149; through *The Pharm. Jour. and Pharmacist*, Aug. 16, 1919.

Modified Formula for Calomel Prophylactic Ointment. —The claim is made by Duret that the following combination gives a preparation of far greater prophylactic value against syphilitic exposure than the original formula of Metchnikoff, which is now officially recognized in France. Duret's formula is as follows:

Precipitated Calomel	10.0
Crystalline Magnesium Chloride	10.0
Sodium Bicarbonate	7.0
Thymol	0.15
Camphor	0.35
Glycerole Starch	15.0
Nut Oil	15.0
Anhydrous Wool-fat	20.0
Distilled Water	25.0

This combination is brought together as follows: The magnesium chloride and sodium bicarbonate are triturated with the water; the calomel is added and then the glycerole of starch. The anhydrous wool-fat is melted with 10 grams of the oil; the camphor and thymol are now dissolved in 5 grams of the oil and added to the melted mixture; this then added to the calomel mixture and the whole thoroughly mixed in a mortar until a uniform mixture is produced.—P. Duret, *Annales Institut Pasteur*, 1919; *Répertoire de Pharm.*, 30: 196.

VENOM OF BEE STINGS.—M. Arthus noted that the symptoms produced by poisoning with the secretion from the poison glands of bees show that the venom is a proteotoxin. In many respects it is similar to scorpion venom. It has a hypotensive action, similar to the scorpion venom, and which is sometimes very considerable although it differs from this venom in that it has no sialagogue or mydriatic action. The investigator also noted rabbits treated with this toxin gave unmistakable evidence of having marked intestinal peristalsis.—*J. pharm. chim.*, 20: 41, 1919.

CONSTITUENTS OF LEMON JUICE.—R. Huerre, in an investigation of the juice of this fruit from three different lots of lemons, found that neither oxalic nor tartaric acids were present in the juice. The specific gravity ranged from 1.048 to 1.064. Expressed in terms of citric acid the total acidity was from 7.14 to 7.8 per cent. One hundred Mils. gave a yield of from 7 to 7.5 grams of citric acid; from 0.40 to 0.60 gram of malic acid; from 0.40 to 0.50 gram of cane sugar; from 1.8 to 2 grams of invert sugar; and from 1.6 to 1.8 grams of ash on incinerating the dry extractive.—*J. pharm. chim.*, 20: 1, 1919; through *The Pharm. Jour. and Pharmacist*, Aug. 16, 1919.

OIL AS A SUBSTITUTE FOR ALCOHOL FOR FLAVORING EXTRACTS.—An interesting suggestion is made by A. Thurston in the *Midland Druggist* in reference to the suitability of using fixed or fatty oils as solvents for culinary flavors in place of the heavily taxed and expensive alcohol. The approach of absolute prohibition makes some investigation along this line rather timely. He states that such oils as cottonseed, olive, or neutral lard oils will be found satisfactory for this purpose. In his estimation these fixed oils hold the flavor much better than alcohol. Their use also has the added advantage

that they act as shortening to any baked pastry. To make an oily extract of vanilla or tonka beans he advises that 1 part of the solid be heated on a water bath to from 70° to 80° C. with 10 parts of oil for 30 minutes, and then strained. If vanillin or coumarin is used he suggests that a solution of these can very readily be made in the proportions of 1 in 40 or 1 in 50; these will give a flavor about 10 times stronger than an oily extract of the beans.—*Midland Druggist*, 1919, pp. 53, 88.

INCOMPATIBILITIES OF STRYCHNINE SULPHATE.—Among the requirements of strychnine sulphate in the French Codex is one that it must be neutral, in contradistinction to the U. S. P. requirement which allows some latitude, it stating that strychnine sulphate should be neutral or slightly acid. A perfectly neutral salt naturally will be somewhat incompatible in a solution such as the following which is in great vogue among French physicians as a hypodermic injection: Sodium cacodylate, 0.50; strychnine sulphate, 0.02; distilled water, to make 10 Mils. At first this solution makes up clear but after a short time a crystalline precipitate of strychnine cacodylate slowly makes its appearance and adheres to the sides of the bottle or ampul. This is due to the lack of solubility in water of the strychnine cacodylate formed by double decomposition. There are a number of proprietary ampuls of this combination on the market which, although they have the correct amount of these very active ingredients, do not show any evidence of precipitation of this potent salt. This is brought about by substituting for part of the distilled water a small amount each of glycerin and alcohol. The modified formula for this injection gives a solution which is permanent and without any possibility of dangerous consequences.

Strychnine Sulphate		0.02
Sodium Cacodylate		0.50
Alcohol, 90 per cent		4.00
Glycerine		2.00
Distilled Water, boiled	to make	10.00 Mils.

One Mil., which is the dose of this hypodermic injection, contains 5 centigrams of sodium cacodylate and 2 milligrams of neutral strychnine sulphate.—E. Cabannes, *Répertoire de Pharm.*, 30: 193, 1919; through *The Pharm. Jour. and Pharmacist*, Aug. 23, 1919.

BOTULISM: I.[1]

The striking symptoms and high fatality of botulism have given to this disease, as to rabies, an interest and a conspicuousness far beyond its relative importance as a cause of death. Two recent fatal outbreaks of "food poisoning," one in Ohio, the other in Michigan, have been attributed, it seems with justice, to botulism intoxication from ripe olives packed in California, and these tragedies have increased the uneasiness felt by some persons about the dangers from this cause. American investigators in the past few years[2] have added much to our knowledge of botulism, and several recent articles, especially, have helped to define the conditions under which this serious form of food poisoning may take place.

It has been shown that the name of botulism, or sausage poisoning, is quite inappropriate to this form of bacterial intoxication as it occurs in the United States. Canned string beans, asparagus, corn, apricots, ripe olives and cheese have been implicated at various times and places, while meat products have seldom been casually connected with such cases. Apparently, the majority of outbreaks on record in this country have been due to household canned foods, and one of the points in dispute has been whether a similar danger is to be feared from factory canned foods. The difference of opinion among workers in this field is exemplified by correspondence recently appearing in the JOURNAL from two correspondents.[3] Some of the points raised in the correspondence are of general interest.

There is no doubt that the early statements of van Ermengem, the discoverer of *B. botulinus*, about the low heat resistance of this organism are incorrect if applied to all conditions or all strains. Most of the American strains, so far from being killed by heating to 80 C. for one hour, will withstand much higher temperatures, some even resisting the temperature of boiling water for a consid-

[1] From *Journal Amer. Med. Assoc.*, December 13, 1919.

[2] Georgina S. Burke: "The Effect of Heat on the Spores of *Bacillus Botulinus:* Its Bearing on Home Canning Methods," Part 1, *J. A. M. A.*, 73: 88 (Jan. 11), 1919. "The Relation of Forage Poisoning to Botulism," editorial, *Ibid.*, 73: 611 (Aug. 23), 1919; "Spoiled Canned Food," 73: 914 (Sept. 20), 1919. Charles Thom, Ruth B. Edmondson and L. T. Giltner: "Botulism from Canned Asparagus," *Ibid.*, 73: 907 (Sept. 20), 1919. John Weinzirl: "Bacteriology of Canned Foods," abstr., *Ibid.*, 72: 1031 (April 5), 1919. "*Bacillus Botulinus* Poisoning in Detroit," General News, *Ibid.*, 73: 18 (Nov. 1), 1919.

[3] Georgina S. Burke: "Spoiled Canned Foods and Botulism," *J. A. M. A.*, 73: 1078 (Oct. 4), 1919. John Weinzirl: *Ibid.*, 73: 1789 (Dec. 6), 1919.

erable period. The history of the canned foods implicated in botulism poisoning shows that the spores of *B. botulinus* pass through the ordinary processes of household canning without destruction. It seems to be a fact that, as far as recorded cases go, only two or three instances of botulism have been traced to factory canned goods, as against a much larger number attributed to foods prepared in the household. Whether this difference is due to the superior germicidal efficiency of factory methods of heating or to the circumstance that spoiled or swelled canned goods are more likely to be eliminated in the course of ordinary trade procedures or to a combination of these factors cannot be definitely established at this time. It does not seem, however, that we are justified in asserting that a danger is entirely absent because it is exceedingly slight.

The main point of difference between the correspondents mentioned seems to hinge on the interpretation given by Weinzirl to the results of an extended bacterial examination of canned foods undertaken in the Department of Preventive Medicine at Harvard University.[4] The investigation forms part of a comprehensive study of canned foods, which is being carried out under the direction of Dr. M. J. Rosenau with the aid of a grant supplied by the National Canners Association. The conclusion drawn by Weinzirl to which particular exception has been taken is that "food poisoning organisms, such as *B. botulinus*, *B. enteriditis*, etc., are not found in commercial canned foods." It is unfortunate that this matter was not allowed to rest in the form in which it appears in the summary of results. "Members of the paratyphoid-enteriditis group were not found, nor was *B. botulinus* ever isolated." This plain description of findings becomes transmogrified by Weinzirl in his "conclusions" into a general statement which would hardly be justified even by a more extensive investigation than that here under discussion, and which in its present form might lead to serious misinterpretation.

On the other hand, it must be admitted that a rather too positive tone pervades portions of Mrs. Burke's letter. It is hardly justifiable to insinuate, however vaguely, that a group of workers is influenced by any consideration other than the desire to seek the truth and find it.

It seems hardly fair or wise to cast discredit on the work of a

[4] John Weinzirl: "The Bacteriology of Canned Goods," *J. M. Research*, **39**: 349 (Jan.), 1919.

group of scientific investigators, comprising some of the best-known names of the country, apparently on the ground that the money for the work has been provided by a commercial association. The word "commercial" is frequently used as a general term of opprobrium, but, as Roosevelt would have said, there is a "good" as well as a "bad" commercialism. It is not our understanding that money was given to Harvard University for the purpose of "exonerating" factory canned goods from any charge whatsoever, but simply for the purpose of discovering actual conditions and, so far as those conditions might be undesirable, of discovering and applying appropriate methods of improvement. It can hardly be assumed that the officials or any of the members of the National Canners Association would favor for an instant a plan to ignore or overlook any danger of botulism poisoning that might exist. Their interests, "commercial" as well as simply human, lie wholly in the direction of discovering what the danger is, how it arises, and how it can best be avoided or overcome. Denial or concealment is the last policy sound business judgment would dictate.

REPORT OF THE INTERNATIONAL COMMITTEE ON ATOMIC WEIGHTS FOR 1919–20.*

The last regular report of this committee, apart from an annual recommendation to continue the use of the table of atomic weights then presented, was published in 1916. The interruption in the series of reports was, of course, due to the World War, which created difficulties of a serious kind among all international organizations. Coöperation with Germany became impossible, partly because of the difficulty of correspondence, and partly because of the personal hostilities created by the conduct of the war. There was also an inevitable slackening of scientific activities, and this was well shown by the unusually small number of new researches in the field of atomic weights. Now that peace is in sight, it seems wise to resume the preparation of these reports, even though they may not be for some time quite so truly international as heretofore. The determinations published since the preparation of our last report may now be summarized as follows:

* Reprinted from *Journal of the American Chemical Society*, Dec., 1919.

HYDROGEN.—A very thorough investigation by Burt and Edgar[1] on the volumetric composition of water has given the volume ratio of hydrogen to oxygen as 2.00288 : 1. From this value, taking the normal liter weights of oxygen and hydrogen as 1.42900 and 0.089873 Gm., respectively, the atomic weight of hydrogen becomes 1.00772, or, rounded off, 1.0077. Guye,[2] from a discussion of Burt and Edgar's data, accepts this value as lying between the two extremes of 1.00767 and 1.00773. If, however, instead of trusting to the densities of the gases and their physical constants exclusively, we take into account the admirable researches of Morley, Noyes and others, upon the synthesis and analysis of water,[3] the most probable general mean for the atomic weight of hydrogen becomes 1.0078, which differs from the volumetric value by only 1/10000; that is, the two distinct lines of attack upon the problem agree within the limits of actual uncertainty. For ordinary purposes the approximate value 1.008 is close enough. It must be remembered that the tables prepared by this committee are for the use, not so much for specialists, as for working chemists in general; and too much refinement will only lead to confusion. No determinations of these or any other constants can be absolute and final. All are subject to errors which may be reduced nearly, but not quite, to insignificance, but never eliminated entirely. For example, in the determination of atomic weights from gaseous densities it is not possible to guarantee the *absolute* purity of the gases, or to avoid errors in weighing, in reductions to a vacuum, or in the values given to the physical constants that are used in the final computations. Some of these errors may be so small as to be negligible, and in the aggregate they may tend either to reinforce or to compensate one another, but their extreme magnitude can be estimated with some approach to accuracy, and expressed by means of the usual ± sign. At present an accuracy to within 1/10000 is the best we can expect to obtain.[4]

CARBON.—Two investigations on the atomic weight of carbon were reported from the Geneva laboratory in 1918. First, Stahr-

[1] *Phil. Trans.*, 216A: 393, 1916. This research was noted in the previous report for 1917. Its review by Guye renders its repetition desirable here.

[2] *J. chim. phys.*, 15: 208, 1917.

[3] Computation by F. W. C.

[4] For an elaborate discussion of sources of error in atomic weight determinations, see Guye and his colleagues (M. Germann, Moles and Renard) in *J. chim. phys.*, 14: 25, 195, 204, 1916; 15: 60, 360, 405, 1917; 16: 46, 1918.

foss[5] determined the density of acetylene, ethane and ethylene. Acetylene proved to be unsatisfactory, because of its tendency to polymerize. From ethane he obtained the value C = 12.006, and from ethylene C = 12.004. On account of some uncertainties in the reduction, he prefers, provisionally, the value C = 12.00.

Secondly, Batuecas[6] determined the density of ethane, and reduced his observations by 3 methods, giving C = 12.005, 11.999 and 11.996. The last two being concordant he regards as preferable, and their mean, C = 11.998, he adopts. It will be remembered that Richards and Hoover, by purely chemical methods, found C = 12.005; and a later combination of all determinations published before 1918 gave the chairman of the committee the mean value C = 12.0025. For ordinary purposes the rounded-off value C = 12.00 may be used, and is so given in the table.

BROMINE.—Three sets of determinations of the molecular weight of hydrogen bromide have been made in Guye's laboratory at Geneva, by Moles,[7] Reiman,[8] and Murray.[9] The acid used was prepared by several distinct methods, and all gave concordant results, which may be summarized as follows, when H = 1.0078:

	Mol. Wt. HBr.	At. Wt. Br.
Moles	80.9332	79.9254
Reiman	90.932	79.9242
Murray	80.930	79.9222

These values are wonderfully concordant and the variations are far within the allowable limits of experimental error. In a recent combination, by the chairman of this committee, of all the available data relative to the atomic weight of bromine, the value found was Br = 79.9228, in complete harmony with the Geneva determinations. For ordinary purposes the rounded-off figure 79.92 is enough.

BORON AND FLUORINE.—In a very original investigation Smith and Van Haagen[10] have simultaneously redetermined the atomic weights of boron and fluorine. Their starting point was anhydrous borax,

[5] *J. chim. phys.*, 16: 175, 1918.

[6] *Ibid.*, 16: 322, 1918.

[7] *Ibid.*, 14: 389, 1916. See review by Guye in the same number, p. 361.

[8] *Ibid.*, 15: 293, 1917.

[9] *Ibid.*, 15: 334, 1917. Reiman and Murray assume H = 1.008; Moles prefers 1.0076.

[10] *Carnegie Inst. Pub.*, 1918, p. 267.

$Na_2B_4O_7$, and their chief difficulty was in insuring the complete dehydration of that compound. The salt was then converted, in a series of successive experiments, into sodium sulphate, carbonate, nitrate, chloride and fluoride, which gave 8 independent values for boron ranging from 10.896 to 10.905, in mean, 10.900. This value was computed with Na = 22.997, Cl = 35.457, S = 32.064, N = 14.010 and C = 12.005. The authors finally discuss all previous determinations and show wherein they were affected by errors. The new value 10.900 should be adopted as the most probable.

In this research sodium fluoride was compared not only with borax but also with the sulphate, and the 8 values found ranged from 19.002 to 19.008, in mean 19.005. The rounded-off value F = 19.0 may be retained for all practical purposes.

LEAD.—Oechsner de Coninck and Gérard[11] have attempted to determine the atomic weight of lead by calcination of the nitrate, and find Pb = 206.98 when N_2O_5 = 108. This determination is evidently of no present value. With this exception the other recent researches relative to this constant have referred to isotopic lead, and the normal element is considered only in comparison with it. Richards and Wadsworth,[12] for instance, find for normal lead Pb = 107.183, and Richards and Hall[13] give Pb = 207.187, values slightly lower than the accepted 207.20 as determined by Baxter and Grover. Similar determinations by A. L. Davis[14] gave discordant results. As for isotopic lead its atomic weight is so variable as to show that it is nearly, if not always, a mixture of isotopes, and not a constant which can as yet be placed in the table. The values found have very great significance, but they are far from final.[15]

GALLIUM.—By the analysis of carefully purified gallium chloride, Richards, Craig and Sameshima[16] find Ga = 70.09 and 70.11. These determinations, however, are only preliminary, but they justify the provisional adoption of the value 70.10. The original values given

[11] *Compt. rend.*, 163: 415, 1916.

[12] *J. Am. Chem. Soc.*, 38: 2613, 1916.

[13] *Ibid.*, 39: 537, 1917.

[14] *J. Phys. Chem.*, 22: 631, 1918.

[15] For discussions regarding the atomic weight of isotopic lead see the Presidential address of Richards before the American Association for the Advancement of Science, in December, 1918. Also F. W. Clarke, *Proc. Nat. Acad. Sci.*, 4: 181, 1918.

[16] *Proc. Nat. Acad. Sci.*, 4: 387, 1918.

by the determinations of Lecoq de Boisbaudran vary from 69.70 to 70.12, the last one being very near the new value.

ZIRCONIUM.—From the ratio between zirconium chloride and silver, Venable and Bell[17] find Zr = 91.76. Although this determination is regarded as preliminary, the authors, by pointing out sources of error in all previous values, believe the new one to be the most probable. It seems best, however, to await the complete investigation before changing the value heretofore accepted.

TIN.—Baxter and Starkweather,[18] by electrolyses of stannic chloride, find Sn = 118.703 when Cl = 35.457. This is in complete agreement with Briscoe's determination, Sn = 118.698. The value 118.70 has already been adopted by the committee.

TELLURIUM.—Staehler and Tesch,[19] from careful syntheses of tellurium dioxide, find Te = 127.51, which is confirmatory of the accepted value 127.5.

YTTRIUM.—Hopkins and Balke,[20] by conversion of Yt_2O_3 into Yt_2Cl_3, find Yt = 88.9. The ordinary sulphate method is shown to be inaccurate. In a later investigation Kremers and Hopkins[21] determined the ratio between yttrium chloride and silver, and found Yt = 89.33. Since this method is the most trustworthy, the value given by it should be adopted. The other sulphate determinations are questionable.

SAMARIUM.—The atomic weight of samarium has been determined by Stewart and James[22] from the ratio between the chloride and silver. The value found is 150.44, which is essentially that given in the table. No change is needed.

DYSPROSIUM.—Engle and Balke,[23] by conversion of the oxide into the chloride, found Dy = 164.228. Later, by the same method, Kremers, Hopkins and Engle[24] found Dy = 163.83. This discordance, like that already shown for yttrium, led the last-named chemists to determine the ratio between dysprosium chloride and silver, which gave 162.52. The earlier method is discredited and

[17] *J. Amer. Chem. Soc.*, 39: 1598, 1917.
[18] *Proc. Nat. Acad. Sci.*, 2: 718, 1916.
[19] *Z. anorg. allgem. Chem.*, 98: 1, 1916.
[20] *J. Am. Chem. Soc.*, 36: 2332, 1916.
[21] *Ibid.*, 41: 718, 1919.
[22] *J. Am. Chem. Soc.*, 39: 2605, 1917.
[23] *Ibid.*, 39: 67, 1917.
[24] *Ibid.*, 40: 598, 1918.

the last value, rounded to 162.5, seems to be the one best entitled to acceptance.

ERBIUM.—For this element, by the oxide-chloride method, Wichers, Hopkins and Balke[25] obtained values ranging from Er = 168.00 to 168.84. The method of determination is thus again shown to be untrustworthy.

THORIUM.—In a long series of concordant analyses of thorium bromide, Hönigschmid[26] finds Th = 232.152 from the silver ratio and 232.150 from the silver bromide ratio when Br = 79.916. The value Th = 232.15 should be adopted for general use. He also studied thoria from uranium ores, which contained ionium. For this mixture he obtained an atomic weight slightly in excess of 231.50. This may approximate to the unknown atomic weight of ionium.

URANIUM.—The later series of determinations of the atomic weight of uranium by Hönigschmid and Horovitz[27] was based like their earlier series upon analyses of the tetrabromide. Two sets of analyses were made, one upon a bromide which had been fused in bromine vapor, the other in nitrogen. The value obtained ranged from U = 238.04 to 238.16, the latter being in harmony with their former determinations. The rounded figure 238.2 is given in the table.

HELIUM.—Taylor,[28] using the microbalance for determining the density of helium, finds He = 4.0008. Guye,[29] in a recalculation of the data, finds He = 3.998. The value 4 should be retained.

ARGON.—From the density and compressibility of argon, Leduc[30] finds A = 39.91. He regards the second decimal as uncertain, and advises the adoption of the rounded value 39.9.

In the following table of atomic weights proposed for 1920, few changes have been made from the values given in the last preceding table. The new values are A = 39.9; B = 10.9; Ga = 70.1; Th = 232.15; and Yt = 89.33. In addition to these the atomic weight of nitrogen should be changed from 14.01 to the more precise value 14.008. The latter figure represents all the best determinations,

[25] *J. Amer. Chem. Soc.*, 40: 1615, 1918.
[26] *Z. Electrochem.*, 22: 18, 1916.
[27] *Monatsh.*, 37: 185, 1916.
[28] *Phys. Rev.*, 10: 653, 1917.
[29] *J. chim. phys.*, 16: 46, 1918.
[30] *Compt. rend.*, 167: 70, 1918.

INTERNATIONAL ATOMIC WEIGHTS, 1920.

	Symbol.	Atomic Weight.		Symbol.	Atomic Weight.
Aluminum	Al	27.1	Molybdenum	Mo	96.0
Antimony	Sb	120.2	Neodymium	Nd	144.3
Argon	A	39.9	Neon	Ne	20.2
Arsenic	As	74.96	Nickel	Ni	58.68
Barium	Ba	137.37	Niton (radium emanation)	Nt	222.4
Bismuth	Bi	208.0	Nitrogen	N	14.008
Boron	B	10.9	Osmium	Os	190.9
Bromine	Br	79.92	Oxygen	O	16.00
Cadmium	Cd	112.40	Palladium	Pd	106.7
Caesium	Cs	132.81	Phosphorus	P	31.04
Calcium	Ca	40.07	Platinum	Pt	195.2
Carbon	C	12.005	Potassium	K	39.10
Cerium	Ce	140.25	Praseodymium	Pr	140.9
Chlorine	Cl	35.46	Radium	Ra	226.0
Chromium	Cr	52.0	Rhodium	Rh	102.9
Cobalt	Co	58.97	Rubidium	Rb	85.45
Columbium	Cb	93.1	Ruthenium	Ru	101.7
Copper	Cu	63.57	Samarium	Sa	150.4
Dysprosium	Dy	162.5	Scandium	Sc	44.1
Erbium	Er	167.7	Selenium	Se	79.2
Europium	Eu	152.0	Silicon	Si	28.3
Fluorine	F	19.0	Silver	Ag	107.88
Gadolinium	Gd	157.3	Sodium	Na	23.00
Gallium	Ga	70.1	Strontium	Sr	87.63
Germanium	Ge	72.5	Sulphur	S	32.06
Glucinum	Gl	9.1	Tantalum	Ta	181.5
Gold	Au	197.2	Tellurium	Te	127.5
Helium	He	4.00	Terbium	Tb	159.2
Holmium	Ho	163.5	Thallium	Tl	204.0
Hydrogen	H	1.008	Thorium	Th	232.15
Indium	In	114.8	Thulium	Tm	168.5
Iodine	I	126.92	Tin	Sn	118.7
Iridium	Ir	193.1	Titanium	Ti	48.1
Iron	Fe	55.84	Tungsten	W	184.0
Krypton	Kr	82.92	Uranium	U	238.2
Lanthanum	La	139.0	Vanadium	V	51.0
Lead	Pb	207.20	Xenon	Xe	130.2
Lithium	Li	6.94	Ytterbium (Neoytterbium)	Yb	173.5
Lutecium	Lu	175.0	Yttrium	Yt	89.33
Magnesium	Mg	24.32	Zinc	Zn	65.37
Manganese	Mn	54.93	Zirconium	Zr	90.6
Mercury	Hg	200.6			

and is probably correct to within 1 in the third decimal place. For so small a value the change is insignificant.

[Signed], F. W. CLARKE,
T. E. THORPE,
G. URBAIN.

OLIVE OIL SITUATION IN ITALY.[1]

BY A. A. OSBORNE,

SECRETARY TO THE COMMERCIAL ATTACHÉ, ROME, AUG. 23, 1919.

Last year's total yield of olive oil in Italy, although it exceeded the average annual yield for the past ten years, was not sufficient to provide for the total yearly consumption, according to a communication to *Il Sole*. The monthly consumption of edible olive oil in Italy ranges at present from 120,000 to 130,000 quintals. This means that the average annual requirements amount to 1,500,000 quintals. The most favorable estimates of next year's production go no higher than 1,300,000 quintals.

The apparent deficiency of 200,000 quintals in olive oil production (obtained from the excess of requirements over production as they are both given above) must be made this year to supply oil to the redeemed territories, where the inhabitants have been almost without edible oils and fats during the war and are eager to secure them now in large quantities. The continued and prospective scarcity of butter likewise will result in a demand for oil to take its place.

The writer goes on to point out that a substantial portion of Italy's olive oil requirements must be met by importations. For imported olive oil, the market prices must naturally be paid, which are not subject to regulation by the Italian Government. The only price policies left open to the Government regarding this imported oil are two: (1) To sell the imported oil to the consumer at the domestic price, the Government bearing the loss; (2) to raise the fixed price of domestic oil so as to accord with the price paid for the imported oil.

[1] From *Commerce Reports*, Oct. 16, 1919.

GUM TRAGACANTH.[1]

In the course of a report furnished by the Revenue Commissioner in Mesopotamia it is stated that the most valuable of the gums collected is tragacanth, which is produced by tapping small shrubs which grow all over the mountains of Southern Persia, and from there through the entire mountainous region which runs northwest along the frontiers of Mesopotamia, comprising such areas as northern Arabistan, the Luristan-Pust-i-Kut country, and Kurdistan. The most important collecting center for Bagdad is Suleimanaya, the capital of the Suleimanaya district of Kurdistan, situated about 180 miles to the northeast of Bagdad. In this area there is a regular trade in this gum for the Bagdad market. The gum is called "Al-kitirah" in Arabic. The method of tapping the bushes is as follows: The Kurds first burn all the leaves off the bushes, then expose the roots, cut incisions in the roots, and leave for a week or so; they then return and collect the gum which exudes from the roots. The first tapping produces white gum of the best quality, second and subsequent tappings gums of yellow colors and inferior quality. Excessive tappings weaken, and may sometimes kill the bushes. The Kurds bring in the gum to Suleimanaya where it is bought by local merchants who export it to Bagdad on pack transport in caravans, and sell to Bagdad merchants. These merchants export to England and foreign countries. The local customs authorities levy a $12^1/_2$ per cent. tax on the market value in Suleimanaya.

The northern mountainous Kurdish country in the Mosul Vilayet is a mass of mountains and valleys. The mountains are covered with scrub evergreen oak forest, and the higher hills and plateaux are full of these gum bushes. No organized trade, however, appears to exist, although Persian merchants are said to have come down off and on in the past to exploit these gums. The distance from the Mosul town to this gum-bearing country is from 50 to 100 miles. All transport at present is on pack animals, but three unmettaled roads up to the hill country have been constructed. The country is meanwhile wild and unsettled, but with the introduction of law and order, the opening up of the country by means of roads and the construction of a railway to Mosul, which means

[1] From *The Chemist and Druggist*, November 1, 1919.

direct rail from Mosul to Basrah, the exploitation of gums in this country should be possible in the near future. An article written in 1903 in a book about agriculture in the Bagdad Vilayet, states that the export from Bagdad in 1887 was 641,250 kilograms (= 130 tons) and in 1890 it had decreased to 39 tons.

A second kind of gum is produced from a large tree which grows throughout the part of Kurdistan now under British occupation. The tree grows to a great size, 50 feet high and up to 8 feet in girth. It is found scattered throughout the valleys only, especially near the villages in the forests. The tree produces edible fruits, sold for food and extraction of oil in Mosul, Bagdad, and all other local markets of any size in northern Mesopotamia, and also this gum, called "elk" (elch) in Arabic. The method of tapping this elch gum is by making long incisions in the trunks of the trees, placing some receptacle underneath to catch the exudation. A regular trade exists in the Suleimanaya district of Kurdistan, but there is none at all in the north of Kurdistan, which falls in the Mosul Vilayet, although "Button" trees abound in the valleys of that country. The bulk of this elch gum is exported direct from the Suleimanaya district by caravan to Alleppo, where it is used for sizing cloth. Some portion comes to Bagdad city, and there is no foreign export from Bagdad; it is all used locally for (*a*) sizing cloth, (*b*) in local medicines, (*c*) as a local chewing gum, (*d*) in the manufacture of arrack liquor from dates. The price of this gum in Bagdad at present is Re. 1.8.0 per lb. There is no doubt that very large amounts of this gum could be collected from the areas mentioned, under conditions similar to those already described for tragacanth.

A MODIFICATION OF THE PHENYLHYDRAZINE METHOD OF DETERMINING PENTOSANS.*

By Paul Menaul and C. T. Dowell.

Everyone who has made determinations of pentosans by the phloroglucinol method realizes that a shorter and less expensive method is very much needed. This is especially true at this time when it is almost, if not impossible, to buy phloroglucinol even at

* Reprinted from *The Journal of Industrial and Engineering Chemistry*, November, 1919.

the high price asked for it. Our purpose in this short investigation was to try to overcome this difficulty by modifying the phenylhydrazine method so as to make it shorter and at the same time obtain results by this method which would agree with the provisional phloroglucinol method.

Recent investigations make it more and more evident that many compounds other than the pentoses and pentosans give furfurol when they are distilled with hydrochloric or sulphuric acid, and hence neither the phloroglucinol method nor any other method of determining the furfurol coming from such a distillation will enable one to say definitely that the original substance contained a certain per cent. of pentosans.

We thought it should be possible to precipitate the furfurol with phenylhydrazine and determine the excess of phenylhydrazine in the filtrate by the use of some compound which would oxidize the phenylhydrazine. Tests were made using solutions of phenylhydrazine sulphate and iodine, potassium dichromate, ferric sulphate, sodium hypobromite and Fehling's solution. With the iodine almost theoretical results were obtained when a large excess of it was used. The amount of ferrous salt found was always less than the theoretical. No better results were obtained with the other oxidizing agents. These results are in harmony with what Chattaway[1] found in his work on the hydrazines. R. Adan[2] found that the reaction between phenylhydrazine, zinc and copper sulphate always gave less than the theoretical amount of nitrogen. He stated that secondary products such as chlorophenylhydrazine and diazo compounds were formed when hydrochloric acid was present. E. Ebler[3] found that a quantitative yield of nitrogen was obtained in the reaction between an ammoniacal solution of copper sulphate and hydrazine. We thought that this reaction might be quantitative for phenylhydrazine also if no chloride or other halogen ion was present in the solution to cause the side reactions found by Adan. The distillation, was therefore made using sulphuric instead of hydrochloric acid and using sodium sulphate instead of sodium chloride to lessen the solubility of the precipitate.[4] In the distillation the volume in

[1] *J. Chem. Soc.*, 91: 1323, 1907; 95: 1065, 1909.

[2] *Bull. soc. chim. Belg.*, 21: 211, 1907; abstracted in *J. Chem. Soc.*, [II] 91: 657, 1907.

[3] *Z. anorg. Chem.*, 47: 371, 1905; abstracted in *J. Chem. Soc.*, [II] 90: 53, 1906.

[4] Recommended in U. S. Department of Agriculture, Bureau of Chemistry, *Bulletin* 49.

the flask was kept practically constant by adding water as the distillation proceeded.

After the addition of the phenylhydrazine to an aliquot of the distillate the solution was stirred for the required time by bubbling carbon dioxide into it. An aliquot (50 Cc.) of the filtrate from the hydrazone was put by means of a dropping funnel into a 250 Cc. Fresenius nitrogen bulb,[5] which had been previously filled with a 10 per cent. solution of ammoniacal copper sulphate and heated to expel the air. A 100 Cc. burette was connected to the tube of the Fresenius bulb and a glass tube provided with a stopcock connected the neck of the bulb with a Schiff's nitrometer containing sulphuric acid. The aliquot of the filtrate was brought into the bulb through the dropping funnel by closing the cock leading to the nitrometer and lowering the burette. The bulb was then heated so as to keep the reaction mixture near the boiling point until the reaction was complete.

Results obtained, using the above method to determine the pentosans in three samples of grain sorghum which were cut at different stages of growth, are given in the table below. Results obtained by Mr. Freidemann of this laboratory using the same samples and the phloroglucinol method are given for comparison. Neither Mr. Freidemann nor Mr. Menaul knew what results the other had obtained until the work had been finished.

TABLE SHOWING WEIGHTS OF PENTOSANS IN ONE GRAM OF SORGHUM.

No.	Phloroglucinol Method. Gram.	Phenylhydrazine Method. Gram.
I	0.1790	0.1788
II	0.1523	0.1526
III	0.2149	0.2150

Other determinations showed that the addition of sodium sulphate to the distillate with the phenylhydrazine was not necessary. The same volume of nitrogen was obtained by taking two parts of the distillate to one of which sodium sulphate had been added and not to the other.

The time required to make a determination of the excess of phenylhydrazine in the filtrate is about 20 min. This method then makes it possible to use a much cheaper substance than phloroglu-

[5] See catalogue of Central Scientific Company, p. 371.

cinol and to make a determination of pentosans in a much shorter time.

OKLAHOMA AGRICULTURAL EXPERIMENT STATION,
STILLWATER, OKLAHOMA.

NOTES ON ALUMINIUM FLARES.[1]

BY ERNEST H. BRITTAIN.

The use of magnesium ribbon and powder in flashlight photography is familiar to every chemist, but it is not so generally known that aluminium is more frequently used in the various signal lights, rocket stars, ground flares, etc., which became so familar during the great war. Aluminium is used in the form of fine powder similar to the aluminium bronze used in making aluminium paints, etc., and for pyrotechnic purposes is compounded with barium or potassium nitrate and other ingredients in varying proportions, according to the specific purpose for which the flare may be required. Sometimes a mixture of aluminium and magnesium is used, as in the "star compositions" used in signal rockets. The aluminium powder should be very fine, capable of passing through a 120-mesh sieve, and should be as free from oil, grease, or soap as possible. It must also be free from grit, sand, or other impurities. There are two kinds of aluminium powder on the market—a dull grey variety and a bright, lustrous, silvery kind (but every gradation between is also made). The lustrous kind is used for aluminium paints on account of this property, and its luster is due to the use of oil or grease in manufacture. This kind is not so suitable for pyrotechnical purposes as the dull grey, since it is more dangerous when compounded. Even dull aluminium powders frequently contain considerable percentages of oil, oil being used by the manufacturer as a safety precaution. The powdering of aluminium is a dangerous business, as spontaneous combustion is not infrequent, and with the intense heat of burning aluminium, to say nothing of the explosive violence of such conflagrations, any measure of precaution is welcomed by the manufacturer. The exact cause of these spontaneous ignitions is unknown, but the use of oil in powdering seems to prevent them to a considerable extent. Even then the mills are operated in the open, or only under rough sheds, and left unat-

[1] From *The Chemist and Druggist*, November 22, 1919.

tended while running for considerable periods, the progress being watched from a safe distance. The oil, which is often impure, is undesirable for flare purposes, as small percentages have a detrimental effect upon the brilliancy and vigor of the flare compositions, as well as introducing an additional element of risk into these explosive combinations. This applies more to aluminium than to magnesium, for paraffin wax can be, and is, used in considerable proportions in magnesium combinations. Paraffin wax does not introduce an element of risk here, but it undoubtedly has a greater retarding effect upon aluminium than on magnesium. A typical *star composition* is composed of:

Magnesium in powder (60 mesh)	27 parts
Aluminium in powder (120 mesh)	9 parts
Barium Nitrate (100 mesh)	58 parts
Paraffin Wax	6 parts

The paraffin wax is melted and the aluminium and magnesium incorporated (away from any naked lights). The mixture should be maintained at about 70° C. till the metallic powder is thoroughly coated with the melted wax. Allow to cool, pass through a sieve, and then mix with the barium nitrate. The barium nitrate must be anhydrous and in fine powder. The whole should be sifted to ensure uniformity. The composition is then pressed into suitable containers, with priming and quick-match for ignition. For use as a *ground flare* a short length of ordinary rolled cardboard tube plugged at one end with clay will do quite well. The priming may be:

Sulphur	2 parts
Saltpetre	6 parts
Orpiment (or black Antimony)	1 part

made into a paste with shellac solution.

Another formula, used as a *ground light*, is as follows:

Barium Nitrate	3,000 grams
Aluminium (120 mesh)	800 grams
Aluminium (60 mesh)	400 grams
Castor Oil	60 grams

An excellent *flare*, fairly slow in burning, but giving a good light, and used in illuminating enemy working parties, is composed of:

Barium Nitrate	55 parts
Aluminium	20 parts
Potassium Nitrate	4 parts
Sulphur	20 parts
Powdered Shellac	1 part

If the shellac is increased to 3 per cent. or 5 per cent., the flare is slower in burning, but loses its brilliancy. In general, the brilliancy and fierceness of burning increases with the percentage of aluminium up to fifty, and is decreased by the addition of such substances as sulphur, or shellac, or borax, or castor oil. The fiercest and brightest aluminium combination consists of:

Aluminium in fine powder	1 part
Barium Nitrate	1 part

If this mixture is packed in an iron tube, say $^3/_4$ in. bore, and with walls of $^1/_{16}$ in. thickness of metal, it will melt and burn the iron like so much paper. As combustion proceeds down the tube the walls fuse and molten globules of white-hot metal fall to the ground. If a tube of any considerable length be used it should be stuck in the ground at an angle, as the molten metal falling vertically may fire the composition at the base of the tube and cause a powerful explosion. Though the proportions in the above formula give an excess of aluminium over what would be necessary for chemical equivalents, the mixture is much fiercer and brighter.

Aluminium	1 part
Barium Nitrate	3 parts

gives a mixture which more nearly corresponds to molecular equivalents.

Potassium nitrate may be used instead of barium nitrate in these combinations. The burning is slightly slower, and the light of a different character, as may be imagined, the lilac potassium flame being different from the green of barium. In the same way the mixing of borax in a flare gives the yellow sodium flame, but the intensity of the aluminium flame makes these colored effects only slight variations from the characteristic dazzling "whiteness." Aluminium flares are not quite so "white" as magnesium ones, but the heat of combustion is much higher. Simple mixtures of aluminium powder and barium nitrate in dry powders do not bind well

for packing in containers or tubes, and tight packing is essential to regularity and length of burning. Consequently such substances as boiled or castor oil, paraffin wax, shellac, borax, bird-lime and even small percentages of sodium nitrate (which is deliquescent), are incorporated, and allow of more compact packing. These flare combinations will all stand quite a lot of direct pressure, but glancing blows or friction should be avoided. They are less sensitive than gunpowder, but must nevertheless be looked upon as explosives, and though they burn safely enough with free access to the air, under conditions of confinement they are liable to violent explosion.

THE SANTONIN MARKET.[1]

The recent enormous advance in the price of this vermifuge, hitherto regarded as indispensible, took by surprise even those who have been closely following the upward movements from time to time. In view, however, of the fact that the sole source of supply is Eastern Turkestan, which part of the world would appear to have come wholly under the control of the Bolshevists, the successive advances in price which had hitherto taken place can hardly be said to have come as a surprise. But the last advance was staggering. Fifty pounds sterling per kilo. (1s. per gram), or nearly twenty-two pounds fifteen shillings (more exactly, 22£ 13s. 6d.) per lb., is now the price of a drug which between twenty and thirty years ago was obtainable in cwt. lots at four shillings (4s.) per lb. This lowest price was the result of competition between the various producers of santonin prior to the amalgamation of the various factories in Turkestan, and consequent total elimination of competition. It is stated that the immediate cause of this late enormous advance has been, firstly, the total cessation of fresh imports, and, secondly, the gradual diminution of stock in London, there being, so far as is known, no stock held in any other part of the world which could become available in the direction of averting the threatened famine. The quite small stock of santonin held here is in the hands of the Eastern and Russian Trading Co., Ltd., which company, it is understood, is the sole representative of the combined Turkestan factories, and will, when matters have settled down and have again

[1] From *The Chemist and Druggist*, November 15, 1919.

become more or less normal, handle the entire production of santonin of the factories, which factories will in turn practically control the sale and production of santonin for the whole world. The reason why the Turkestan factories exercise control, and will continue to do so, is found in the fact that the plant, *Artemisia maritima*, from the unopened flower buds (erroneously called wormseed) of which the article is produced, while growing freely in many parts of the world (it is said to be found fairly abundantly on the Essex saltings), only yield santonin in paying quantity when grown on the salt steppes of Turkestan. Of course, it is not impossible, although it is to be hoped not very probable, that the Turkestan factories are hopelessly ruined, in which case the prospects for the future supply would appear to be very remote. It is true that santonin was formerly manufactured in Europe before the Turkestan factories were built, the so-called wormseed traveling, it is understood, a couple of thousand miles by bullock cart before it reached railhead, thence by rail to a Baltic port, to Hamburg, whence it was sent to the one, two, or three makers on the Continent, the drug not having, we believe, been produced on a commercial scale, or in fact at all, in this country. In normal times the santonin produced by the Turkestan factories would also travel by the above route, at least as far as a Baltic port. Of course, with affairs in their present condition in Russia all this is a thing of the past. Firstly, the two Turkestan factories are not working; in fact, it is not known really for certain whether they are actually still in existence. Secondly, as far as the latest news—dating, we believe, from late in the year 1917—there was practically no stocks of manufactured santonin left at the factories which do not appear to have been working since that date. It is believed possible that the Bolshevists, when they obtained control of the districts in which the factories are situated, may have been stolen and hidden a thousand kilograms or so of santonin; this is, however, not known for certain, while it is equally uncertain whether such 1,000 kilos, even if the Bolshevists did secure same is still in existence. The primary cause of the late enormous advance in the price of santonin appears to have been the definite and total disappearance of a parcel of forty-nine cases, each containing 50 kilos, which were dispatched from the works some time in 1917 *via* the Siberian Railway to Vladivostok, for shipment thence to Europe. This little lot of nearly two and a half tons, worth at least the present highly inflated price about 120,000 £,

appears to have absolutely disappeared en route. In all probability it was stolen, and the lot is quite possibly still in existence somewhere. To add to the stringency of the situation, it is reported that there are urgent inquiries for santonin on the market from the United States, and if these had led to business the present quite limited stock in the hands of the sole importers would be exhausted. The sole hope in the situation is practically confined to the fact that the present enormous cost will quite certainly so reduce the actual consuming demand that the very meagre stock available may at a pinch last out until matters change and fresh supplies come in, but this is indeed a vague hope. Also, what applies to the importation of santonin also equally applies to the importation of the so-called wormseed, in view of the enormously large bulk of such wormseed. The Eastern and Russian Trading Co., Ltd., state that they have also a certain, not very large quantity of wormseed in stock, but they also state that the quality is not quite suited to the manufacture of santonin, this being probably due to the comparatively low yield of the drug, good manufacturing wormseed yielding about 2 per cent. of santonin. Apart from this fact, the difficulty of manufacture would probably arise, it being open to question whether any of our fine chemical makers would be prepared to undertake the production of santonin on a commercial scale, even assuming that satisfactory raw material were available. Perhaps some French manufacturer might be willing to oblige, but even then the question of suitable raw material would still be the crux. As far as can be judged from the foregoing, the enormous price of santonin would appear likely to be maintained for the present and in the near future, at any rate.

CALCIUM CREOSOTE.[1]

Under the name of *Calcreose* has been introduced a dark brown powder, partially soluble in water, and said to contain in loose chemical combination equal weights of creosote and lime. Its therapeutic effect is similar to that of creosote, while it does not produce gastric irritation. Dose, 0.25 to 1.0 Gm. (4 to 16 grains) every two to four hours (see *The Prescriber*, 1918, p. 47).

A formula for the preparation of a similar compound in liquid form is given in the *Pharmaceutical Journal*. One part by weight of

[1] From *The Prescriber*, December, 1919.

creosote is mixed in a percolator with four or five parts of freshly slaked lime. After the mixture has cooled, water is poured on and allowed to run through slowly until the sp. gr. drops below 1.010, when a fresh portion of creosote is added and the process repeated. The resulting solution of calcium creosote is a reddish yellow liquid, becoming brown on keeping and depositing a precipitate of calcium carbonate on exposure. It has the odor of creosote, a sharp, peppery taste, an alkaline reaction, and marked antiseptic properties. It contains the equivalent of about 3 minims of creosote in each fluid drachm, and affords a means for the administration of creosote in relatively large doses without, as a rule, producing intolerance.

GUAIACOL IODIDE: AN ORGANIC IODINE COMPOUND.[1]

A combination of guaiacol and iodine is recommended by J. Maberly (*Med. Jour. S. Africa*, 14: 367 (Feb.), 1919) as a convenient means for the administration of iodine in organic combination. This is prepared according to the following formula:

Guaiacol, pure	1 minim.
Solution of Iodine (12½ grs. in one ounce S. V. R.)	1 minim.
Rectified Spirit	20 minims.
Distilled Water	to 60 minims.

The drugs are mixed in the order given above, a slight rise of temperature taking place on the addition of the water. The free iodine disappears and a stable compound is formed in which the iodine, or a portion of it, replaces hydrogen in the guaiacol. One drachm of guaiacol-iodide solution prepared as above represents 0.026 grain (about 1/40 grain) of iodine.

The dose of this solution is one drachm, mixed with an equal quantity of simple syrup and two drachms or more of water. Maberly recommends its use in all cases in which iodine internally is indicated, such as glandular enlargements, etc. The dose is suitably reduced in the case of children.

[1] From *The Prescriber*, December, 1919.

PRELIMINARY REPORT ON PRODUCTION AND STOCKS OF NAVAL STORES.

The following preliminary report on the production and stocks of naval stores is made by the Bureau of Chemistry, United States Department of Agriculture:

PRODUCTION.

The statistics compiled by the Bureau of Chemistry from individual reports from producers show that there was made during the first half of the present season, up to August 1, about 163,000 casks of turpentine and 491,000 round barrels of rosin (500-pound barrels). Producers' estimates for the balance of the season from August 1 to the close of operations, indicate that about 174,000 casks of turpentine and 547,000 round barrels of rosin will be made during this period, indicating a total production for the season of 337,000 casks of turpentine and 1,038,000 barrels of rosin. This does not include wood turpentine, wood rosin or rosin reclaimed from batting dross. The actual figures are as follows:

On Hand at Stills April 1, 1919.		Made This Year up to Aug. 1, 1919.		Estimated Production Balance of season.		On Hand at Stills Aug. 1, 1919.	
Turp.	Rosin.	Turp.	Rosin.	Turp.	Rosin.	Turp.	Rosin.
24,050	130,035	163,301	491,110	174,433	547,165	19,364	115,702

A comparison of these figures with the reports issued as of August 1, 1918, and March 31, 1919, show that the production during the first half of the present season was approximately the same as for the same period in 1918. More trees are being worked this year than last year, but unseasonable weather conditions and excessive rains throughout the turpentine-producing sections kept production down during the early part of the season. The weather has been very favorable since September 1, and it is believed that the production for the latter half of the season will be greater than shown by the estimates, indicating that, for the entire season, the production will be at least equal to, and possibly slightly greater than that of the 1918–1919 season.

QUANTITIES AT STILLS.

The quantity of turpentine and rosin on hand at the stills on August 1, 1919, was considerably less than on the same date last year, as shown by the following figures:

	Turpentine.	Rosin.
On Hand at Stills Aug. 1, 1918.....	59,000 casks	170,000 bbls.
On Hand at Stills Aug. 1, 1919.....	19,000 casks	115,000 bbls.

This decrease is undoubtedly due to the higher prices prevailing this year and to the increase of exports.

The stocks of turpentine at the stills decreased 16,000 barrels, and rosin decreased 45,000 barrels from March 1, 1919, to April 1, 1919, the last month of the naval stores year, when practically nothing was made. This decrease is shown by the following figures:

	Turpentine.	Rosin.
On Hand at Stills March 1, 1919.....	40,000 casks	175,000 bbls.
On Hand at Stills April 1, 1919.....	24,000 casks	130,000 bbls.

Production has been greater in Georgia and Florida this year, up to August 1, than it was last year. In the other states it has been less this year than it was last. This, together with the fact that large quantities of old turpentine and rosin which had been made during previous seasons and tanked and stored at the stills, have been shipped into the three main eastern ports this year, probably accounts for the considerable increase in receipts reported at Savannah, Jacksonville and Pensacola, compared with last year. This is especially true of turpentine.

STOCKS IN HANDS OF CONSUMING INDUSTRIES ON AUGUST 1, 1919.

The total stocks of turpentine and rosin in the hands of the paper, paper size, paint and varnish, soap, greases and lubricants, shoe polish and leather dressings, rosin oil and pitch, printing ink, sealing wax and insulating materials, soldering flux, matches and woodenware, fly paper, linoleum, automobiles, buggies and wagons, and foundries and foundry supply industries on August 1, 1919, were approximately as follows:

	Turpentine.	Rosin.
On Hand August 1, 1919.....	20,500 casks	182,000 bbls.
On Hand April 1, 1919.....	28,500 casks	203,000 bbls.
Decrease.....	8,000 casks	21,000 bbls.

Many producers and consumers have not furnished promptly the information on their production and stocks. Some have ignored repeated requests. In every case where producer or consumer has

either failed or deliberately refused to send in the reports, conservative individual estimates on such delinquent concerns have been made. These estimates, which are included in the figures given, comprise only 6 per cent. of the total production shown. About 10 per cent. of the total turpentine stocks and about 7 per cent. of the total rosin stocks shown as in the hands of consumers are estimates on such individual concerns from which no information was received.

The value of these estimates to the individual concern and to the entire consuming or producing industry depends on their accuracy and prompt issue. It was hoped to publish the figures several months ago, but their issue was held up by lack of coöperation on the part of certain producers and consumers. It is hoped that in the future a more willing coöperation on the part of producers and consumers may be secured, to the mutual welfare of the interests of both. However, the failure of a small percentage of producers or consumers to submit their data will not prevent the publication of these statistics, but only serve to delay their issue, as estimates must be resorted to in every such case.

CURRENT LITERATURE.

SCIENTIFIC AND TECHNICAL ABSTRACTS.

ESTIMATION OF ARSENIC IN SUBSTITUTED PHENYLARSINIC ACIDS AND THEIR REDUCTION PRODUCTS.—R. G. Fargher (*J. Chem. Soc.*, 1919, pp. 115–116, 982–992).—Ewins (*Analyst*, 42: 50, 1917) considers that the method devised by Lehmann (*Apoth. Zeit.*, 27: 545, 1912; *Analyst*, 37: 415, 1912) for the estimation of arsenic in salvarsan and neosalvarsan, while applicable to some derivatives, fails entirely in many cases, owing to the fact that the preliminary treatment with sulphuric acid and permanganate fails to bring about complete oxidation. It has now been found possible by the use of the modification described below to extend this estimation to many substituted phenylarsinic acids containing nitro-, amino-, hydroxy-, methoxy-, bromo-, and other groups. Some of the powdered substance (0.2 Gm.) is weighed and intimately mixed in a 250 Cc. flask with 1 Gm. of potassium permanganate. Five Cc. of 50 per cent. sulphuric acid are added, followed by a further 10 Cc.

of concentrated sulphuric acid when the first reaction has ended. After a few minutes, 10 Cc. of water are added, and the mixture is heated for half an hour to gentle boiling, precautions being taken against loss by spraying. The manganese dioxide is then removed by a slight excess of hydrogen peroxide, 30 Cc. of water are added, and the solution is again boiled for ten minutes, after which a dilute solution of potassium permanganate is added drop by drop until a faint, permanent pink tinge is obtained. This is discharged by the addition of a drop of dilute solution of oxalic acid. The solution is then cooled, 2.5 Gm. of potassium iodide are added, the whole being allowed to remain for an hour, and the liberated iodine titrated by means of thiosulphate. A blank experiment should be carried out alongside each estimation, and the final reading corrected accordingly. The following are examples of the results obtained:

Substance.	As. Found.	Calc.
3-Nitro-4-hydroxyphenylarsinic Acid	28.4, 28.4	28.5
p-Aminophenylarsinic Acid	34.5, 34.5	34.6
1 : 2-Dihydrobenzoxazolone-4-arsinic Acid	28.6	28.9
3-Nitro-4-aminophenylarsinic Acid	28.9, 28.8	28.6
3 : 3′-Dinitro-4 : 4′-dihydroxydiphenylarsinic Acid	19.6, 19.5	19.5
p-Bromophenylarsinic Acid	26.5	26.7

(From *The Analyst*, November, 1919.)

ANALYSIS OF VASELINE.—G. Armanni and A. G. Rodano (*Annali chim. applic.*, 12: 50–51, 1919).—A method of distinguishing between natural and artificial vaseline has been based upon the different solubilities of the two substances in a mixture of benzene and absolute alcohol (1 : 1). One part of the vaseline is dissolved in 20 parts of the hot solvent, and the solution allowed to stand for twenty-four hours in a cold place. If the vaseline be natural, there will only be a slight oily deposit, while artificial vaseline yields a flocculent or crystalline deposit resembling paraffin wax. In the case of mixtures the amount of precipitate is proportional to the quantity of artificial vaseline present, and the method will detect less than 20 per cent. of the latter. (From *The Analyst*, November, 1919.)

Microscopic Diagnosis of Amebic Dysentery.—For the fixation and staining of amebas, motile and encysted, Haig makes thin smears from the fresh stool, selecting, where present, a portion containing mucus and blood, on cover slips, and floated, without

drying, smear downward, on the following fixing solution: corrosive sublimate (saturated aqueous solution), 2 parts; absolute alcohol, 1 part. Fixation is complete in about thirty minutes. The smears are then placed film upward in iodized alcohol in order to remove the last traces of sublimate, washed in distilled water and then stained as follows: (1) Soak for several hours in a 4 per cent. solution of iron alum (made with violet crystals); (2) wash in distilled water; (3) stain in Heidenhain's hematoxylin for several hours (or over night); (4) wash in distilled water; (5) place in 1 per cent. iron-alum solution until decolorization has reached a satisfactory stage; (6) wash in distilled water and counter stain with 5 per cent. aqueous eosin solution; dehydrate through the alcohols, clear in xylol, and mount on a slide in Canada balsam. (*Lancet*, London; through *Jour. Amer. Med. Assoc.*, Dec. 6, 1919.)

THE ROMANOWSKY STAIN.—Romanese has worked out, he says, a simple and reliable substitute for the Giemsa method. The results seem to be the same with it as with the original Giemsa fluid, while the ingredients are inexpensive and always at hand. He dissolves 0.75 Gm. methylene blue in 50 Cc. of 95 per cent. alcohol and 50 Cc. of glycerin, and adds 3 Cc. of a 10 per cent. solution of sodium carbonate in distilled water, and boils for fifteen minutes. Then he adds 35 Cc. of a 1 per cent. alcoholic solution of eosin and boils fifteen minutes. It is then removed from the fire and alcohol is added to bring the total amount to 100 Cc. It is then set aside, covered closely, for a week. (From *Jour. Amer. Med. Assoc.*, October 11, 1919.)

FORMIC ACID IN THE COMMON NETTLE.—It is commonly stated in text books that formic acid occurs in the stinging hairs of the common nettle (*Urtica dioica*), but there is no satisfactory proof of the statement. When nettles are cut up and distilled with water the reactions for formic acid in the distillate are obtained, but it is now known that various parts of plants yield formic acid when treated in this way; therefore, it is not certain that the formic acid comes from the stinging hairs of the nettles; it may be derived from the general plant tissues. One of the chief chemical reactions of formic acid is its power of reducing salts of silver and mercury, but that s not necessarily conclusive proof in this case. The author appears to have settled the point definitely. By pressing the leaves of grow-

ing nettles between dry filter papers impregnated with barium carbonate the contents of the hairs are absorbed without contamination from juices from any other part of the plant. On appropriate treatment the product yielded barium and lead salts, which were crystalline on glass slides, and the two formates were identified under the microscope. Another question is whether or not formic acid is the main cause of the intense irritation produced by nettle stings; the active irritant is regarded by one investigator as being probably due to an enzyme and not to formic acid. (L. Dobbin, *Proc. Roy. Soc. Edin.*, II, No. 11; through *Nature*, September 18, 1919, p. 64; through *The Pharm. Jour. and Pharmacist*, Oct. 11, 1919.)

TUBERCULOSIS INFECTION.—Calmette (*Ann. Inst. Pasteur*, 1919, pp. 60–68) has established that many kinds of bacteria circulating in the blood are eliminated by the intestine; the bacillus of tuberculosis in particular is taken up by the liver and emptied into the intestine with the bile. Recent experiments have shown that tuberculosis is spread among cattle by the excreta, and this explains infection occurring in stables, and also the presence of tuberculosis bacilli in milk, even that from healthy cows. This fact also draws attention to the spread of tuberculosis through vegetables, due to contamination with tuberculous manure, and its propagation on farms and in rural districts. (From *The Chemist and Druggist*, October 18, 1919.)

DETERMINATION OF GLYCYRRHIZIN.—Dissolve 3 Gm. of ext. glycyrrhizae dried at 100° in 30 Cc. of water containing 5 drops of solution of ammonia, and filter. To 20 Cc. of filtrate add 2.5 Cc. of sulphuric acid and allow to stand for twenty-four hours. Decant the limpid liquid upon a filter, wash the residue with a total of 30 Cc. of water, filter and reject the washings. Dissolve the residue with 1 to 2 Cc. of solution of ammonia, pass the solution through the filter, and wash with 10 Cc. of water containing 5 drops of solution of ammonia until the washings are colorless. Evaporate the solution on a water bath and dry at 100°. Add 0.04 Gm. per 40 Cc. of washings and calculate the percentage. (Astruc and Pichard, *J. pharm. chim.*, 18: 289–90; through *The Chemist and Druggist*, Oct. 18, 1919.)

RAPID DIAGNOSIS OF DIPHTHERIA BACILLI.—Debré and Letulle expatiate on the differential importance of Babes' polar granules,

shown up by double staining, in true diphtheria bacilli. Their two years of experience with this method of differentiation has confirmed its precision and reliability. The pseudodiphtheria bacilli never show these granulations at the poles when stained by the technic described, which is a modification of Neisser's first method. The specimen is incubated at 55° C. for twenty hours and each loop of the culture is spread on two slides. One slide is treated with the Gram, the other after fixation by heat is covered with a solution made by dissolving 1 Gm. of methylene blue in 20 Cc. of 95 per cent. alcohol, and adding 950 Cc. of distilled water and 50 Cc. of glacial acetic acid. The smear covered with this solution is heated until it begins to steam. It is then heated a second time, and is then left in contact for five minutes. It is then rinsed rapidly with distilled water and covered with the second stain for ten or twelve seconds and rinsed quickly in distilled water. This second solution is made by dissolving 5.50 Gm. vesuvine in 250 Cc. of boiling distilled water, filtering while still boiling. The granules clustered at the poles of the bacilli, or only in some of them, show up a black oval, larger than the body of the bacillus. In their 800 tests they never found these polar granulated bacilli except with true diphtheria and they always found them then. They warn that one other bacillus may present these granulations, *Bacillus cutis-commune*. But they never found this in the throat in any of their tests. It differs from the diphtheria bacillus further in attacking saccharose. In case of diphtheric lesions elsewhere than in the throat, it might be advisable to test a loop on a sweetened litmus culture medium to exclude this bacillus. (From *Jour. Amer. Med. Assoc.*, Oct. 25, 1919.)

Presence of Aconitic Acid in Sugar-Cane Juice, and New Reaction for the Detection of the Acid.—C. S. Taylor (*J. Chem. Soc.*, 1919, 115, 886–889).—The presence of aconitic acid in sugar-cane juice was inferred by Behr (*Ber.*, 1877, 10, 351) but not conclusively proved. In the author's experiments aconitic acid was isolated from both healthy and diseased sugar cane, though it could not be obtained in crystalline condition from the latter. It is present in the form of a salt and not in the free state in the cane juice. In addition to the usual qualitative test it was found that aconitic acid when treated with acetic anhydride gives a pink coloration, which changes rapidly to deep red and then to magenta. On heating the mixture a bluish green liquid is obtained, which becomes

brown and almost opaque. The magenta liquid apparently consisted of two colored substances, a red compound soluble in water, and a blue compound readily soluble in ether, but both were exceedingly unstable and were rapidly decomposed by water, acids or alkalies. Apparently the color reaction is due to condensation of the carboxyl groups of the acid, with possibly elimination of water or addition of acetic anhydride. Applied as a test the reaction is capable of detecting 0.01 Mgm. of aconitic acid. None of the other acids in sugar-cane juice give the reaction, but citric acid may be detected by melting it in a test-tube, when traces of aconitic acid are produced, which then react with the acetic anhydride. (From *The Analyst*, Sept., 1919.)

ESTIMATION OF LACTIC ACID BY OXIDATION.—O. Schuppli (*Trav. Chim. Aliment. Suisse de Hyg. Pub.*, 1919, p. 44; *Ann. Chim. anal. Appl.*, 1: 222, 1919).—Szeberenyi has devised a method of estimating lactic acid by oxidizing it by chromic acid into acetic acid, carbon dioxide and water, distilling the acetic acid in a current of steam, and titrating the distillate with standard alkali solution. Other organic acids, including malic, tartaric and oxalic acids, are completely oxidized to carbon dioxide and water. In test experiments it was found that 97 per cent. of lactic acid was oxidized into acetic acid, carbon dioxide and water, and 3 per cent. completely oxidized to carbon dioxide and water. The author finds that this method gives satisfactory results with solutions of pure organic acids, but that when applied to wines it gives higher results than those obtained with Möslinger's method, owing to some of the other constituents undergoing incomplete oxidation, and yielding volatile acids. This was confirmed by experiments with cane sugar. (From *The Analyst*, Sept., 1919.)

LOROGLOSSIN, A NEW GLUCOSIDE IN LOROGLOSSUM HIRCINUM.—The biochemical method has given the authors indication of the presence of one or more glucosides in the aerial organs of all the native French orchids investigated. These included members of the genera *Aceras, Cephalanthera, Epipactis, Limodorum, Neottia, Platanthera, Ophrys, Orchis* and *Loroglossum*. A considerable quantity of *Loroglossum hircinum* was cultivated before the war, but the investigation of the material has been possible only recently. It has yielded a new *B*-glucoside, loroglossin, crystallizing in colorless,

odorless, very bitter, long needles; melting at 137° Corr.; $[\alpha]_D$ 42.97°. It is very soluble in water and in alcohol, sparingly soluble in acetone and in acetic ether. It does not reduce Fehling's reagent until hydrolyzed. This occurs when it is heated with dilute sulphuric acid and on contact with emulsin. The glucoside is accompanied in the plant by a considerable amount of glucose. The method by which it is separated is fully described. (E. Bourquelot and M. Bridel, *J. pharm. chim.*, 20: 81, 118, 1919; from *The Pharm. Jour. and Pharmacist*, Sept. 13, 1919.)

SUBSTITUTE FOR SENNA LEAVES.—Since the beginning of 1917 large quantities of so-called Palthe senna leaves have been imported into Germany from Switzerland. They have been identified as the leaves of *Cassia auriculata* L., and are readily distinguished from senna leaves by the rounded and not tapering apex. It is remarkable that they contain no oxymethylanthraquinones and are free from laxative action. With Bornträger's reaction (shaking an infusion with petroleum benzine, separating and shaking the benzine with ammonia) a yellow coloration of the ammonia is produced, whereas with genuine senna leaves a rose color is obtained. (*Pharm. Ztg.*, 64: 242; from *The Pharm. Jour. and Pharmacist*, Sept. 6, 1919.)

MICROSCOPICAL DETECTION OF RHAPONTIC RHUBARB.—Mount a little of the powdered drug in water, wash three times by irrigation with more water, finally removing as much of the water as possible; then allow a mixture of 100 parts of 50 per cent. aqueous solution of potash with 5 parts of 100 volume perhydrol to flow on, and allow the preparation to stand for thirty minutes. Particles of the rhapontic powder will then have assumed an intense blue color, apparently due to a grandular precipitate, while the particles of other rhubarbs are colorless, or orange-rose, or quite exceptionally reddish violet, but never blue and granular.—C. Winimer (*Pharm. Post;* through *Pharm. Ztg.*, 64: 348; through *The Pharm. Jour. and Pharmacist*, Sept. 6, 1919.)

STAIN FOR TUBERCLE BACILLI.—Gasbarrini has long contended that the acids used to decolor the bacilli with the usual technic are too powerful and detract from the effect. To avoid this he uses methylene blue in excess in a solution of 40 Cc. lactic acid in 160 Cc. distilled water, and adds to this at the time of using four parts of

alcohol (95°). This both decolors and recolors at the same time, with the finest and most constant results. It has shown up tubercle bacilli in sputum, urine and stools when the Ziehl gave negative findings, and the accuracy of the lactic acid method was confirmed by the course of the cases. The non-acid resisting bacilli can be differentiated more readily, and the whole procedure takes less time than the ordinary technic. (From *Jour. Amer. Med. Assoc.*, October 11, 1919.)

INSECTICIDAL PRINCIPLE.—This principle in *Chrysanthemum cinerariaefolium*, termed pyrethron by Sato, was found by Yamamoto (*Jour. Tokyo Chem. Soc.*, 40, 1919) to be present principally in the ovary of the flower, particularly abundant during the blooming period, while the other parts of the flower contained very little Pyrethron is an almost neutral mixture, very sensitive to heat and air. On hydrolysis it yields two alcohols, $C_{21}H_{34}O$ and $C_{27}H_{46}O$, one liquid fatty acid, palmitic acid and possibly another solid fatty acid. In a concentration above 0.077 per cent. pyrethron checks bacterial growth. Its saponification number is 216, iodine number 116. (From *The Chemist and Druggist*, October 4, 1919.)

RAPID DETERMINATION OF HYDROGEN ION CONCENTRATIONS.—A new apparatus for determining the dilution of hydrogen ion in bacterial cultures and other fluids is described by Jones. As compared with the colorimetric method, the apparatus here described has wider application, is more accurate, less cumbersome and only slightly less rapid. The hydrogen electrode vessel described was designed with two objects, chiefly, in mind: (1) to provide a vessel accurate at least to 0.01 pH, and (2) to provide a vessel giving rapid saturation with hydrogen gas, and yet one which is easily constructed. A rapid and labor-saving technic combining the indicator, and the gas-chain methods is described, which obviates the difficult task of preparing standard solution for the former methods, and of making needless repetitions by the latter.—(From *Jour. Amer. Med. Assoc.*, Sept. 27, 1919.)

MEDICAL AND PHARMACEUTICAL NOTES.

SACCHARIN STIMULATES BODILY OXIDATION.—That saccharin is harmless, and at the same time worthless as a provider of energy is now generally admitted. Its influence on the process of oxidation

has not been previously investigated. The author and Neill have previously shown that sugar, when ingested with other foods, stimulates the secretion of catalase, and hence increases the process of oxidation in the body. It is now found that saccharin has a much greater action in this direction than sugar. In this respect saccharin is, therefore, a positively helpful adjunct to the dietary. It is specially valuable in a disease such as diabetes, where the principal trouble is defective oxidation. (W. E. Burgo, *Science; J. Soc. Chem. Md.*, 38: 7, R, 1919,; through *The Pharm. Jour. and Pharmacist*, October 11, 1919.)

CHLOROPICRIN VAPOR TO KILL BED BUGS.—Chloropicrin, when used in the proportion of 4 to 10 Gms. to each cubic meter of the capacity of the chamber treated, is an excellent means for destroying bugs. The method has been used successfully in ridding military beds of these insects. Four hours after vaporizing a small, closed chamber containing the beds, all the insects were dead. During the process of vaporizing a military gas mask is a perfect protection to the operator. In case eggs are not destroyed by the first treatment, a second fumigation should be performed at an interval of eight days. (G. Bertrand, Brocq.-Rousseau and Dassonville, *Compt. rend.*, 169: 441, 1919; through *The Pharm. Jour. and Pharmacist*, October 11, 1919.)

KEROSENE AS A REMEDY FOR HARVEST BUGS.—Immediate relief is stated to follow the application of kerosene to the so-called "bites" of the harvest bug, or mowers' mite (*Leptus autumnalis*). In California, the mite is very prevalent among hay. The intense itching caused by the "insects" burrowing beneath the skin is often sufficient to incapacitate the victim from work. The intense irritation causes loss of sleep, and lesions are produced by scratching. All published remedies have proved useless, but the application of kerosene to the body before commencing work in the fields, changing the clothes when the day's work is over, and at once applying a little kerosene to any irritating spots as soon as observed, have given excellent results in alleviating the discomfort caused by this familiar seasonal pest. (Nona Allen, *J. Amer. Med. Assoc.*, 73: 628, 1919; through *The Pharm. Jour. and Pharmacist*, October 11, 1919.)

SUBSTITUTE FOR CACAO IN SUPPOSITORY BASIS.—As a substitute

for oil of theobroma, and to economize the use of spermaceti, which is now difficult to obtain, a mixture of one part of that substance melted in three parts by weight of olive oil may be used. This basis melts at 37.2° C. It is stated to be quite satisfactory for suppositories made by the warm method, but is not applicable for those made by pressure by the cold method. (*Pharm. Post.*, 51: 562, 1918; *Chem. Abstr., Amer. Chem. Soc.*, 13: 1041, 1919.)

EXTRACT OF GLYCYRRHIZA.—For her thesis at Montpelier, Miss G. Pichard undertook a study of the different methods of preparing extract of licorice. The extracts prepared by the use of warm water possess a bitter taste, due to the content of resin present in the bark (10–14 per cent.), which is almost insoluble in cold water. In addition, the glycyrrhizin undergoes partial hydrolysis, so that this method should be rejected. She comes to the conclusion that the method of the U. S. P. gives the highest yield of glycyrrhizin percolation with the addition of solution of ammonia producing a content of 8 per cent. of this glucoside, compared with 4.5 per cent. obtained by percolating with cold water only. (From *The Chemist and Druggist*, October 4, 1919.)

BENZYL BENZOATE IN PROTOZOAL DYSENTERY.—The authors have employed benzyl benzoate in the treatment of eight cases of endamebic dysentery uncomplicated by bacillary infection, and have seen markedly good results in every case. All the cases were of the acute type and varied in severity. No ill effects on the alimentary or excretory tracts followed the administration of benzyl benzoate. In no case has the drug unfavorably altered the course of any case. On the contrary, its administration has always been accompanied by a marked alleviation of both the objective and subjective symptoms of the disease. It gives the patient much needed rest and permits him to sleep at night. Under the administration of the drug the endamebas disappeared from the stools in nearly every case as the general symptoms subsided. The benzyl benzoate we administered in a small amount of cold water, three times a day, after meals. The doses employed varied from 20 to 30 drops of the 20 per cent. alcoholic solution. (From *Jour. Amer. Med. Assoc.*, Oct. 25, 1919.)

Significance of Small Amount of Sugar in Urine.—If with hyper-

tension and chronic nephritis there is but an occasional trace of sugar in the urine and the blood sugar is not unduly high, then, Hamman says, the disordered carbohydrate metabolism must be subordinated to the renal or vascular condition. If there is marked glycosuria and the blood sugar is unusually high, then the diabetes must be emphasized. The clinical history is of importance. Patients past middle life with mild diabetes often gradually develop nephritis and hypertension, so that finally the renal and vascular conditions assume the prominent position in the clinical picture. On the other hand, Hamman has observed patients with hypertension over a number of years and has seen them gradually develop glycosuria and finally a definite intolerance for carbohydrates. (*Canadian Med. Assoc. Jour.;* through *Jour. Amer. Med. Assoc.*, December 6, 1919.)

Use of Platinum Chlorid in Pneumonia.—Anklesaria has made use of a 0.1 per cent. solution of platinum chlorid in 5 minim doses, in combination with Burney Yeo's effervescent quinine mixture, every four to six hours, in the treatment of pneumonia. He claims to have had very good results. The effect in some instances was really very striking. Within twelve hours of the treatment a noticeable change for the better was observed. He has also used quinine in a somewhat different form and manner. An ounce of good quinine is well rubbed with an equal quantity of powdered carbonate of ammonia. The powder is then made into a paste with an ounce of liquor ammoniae and set aside for an hour. Absolute alcohol, 4 ounces, is now added to the paste and the solution is filtered. The filtrate thus obtained is added to a pound of aromatic spirits of ammonia (B.P.). The clear mixture is labeled mixture of quinine carbonate, 1 : 20. It is prescribed as follows:

	Gm. or Cc.	
℞ Sodii bicarbonatis.....	4	ʒ j
Mist. quininea carbonatis.....	8	ʒ ij
Vini ipecacuanhae.....	2	ʒ ss
Syrup aurantii.....	24	ʒ vj
Aquae anisi.....q. s. ad....	180	℥ vj
M Ft. misturam.		
Sig. One ounce every four to six hours.		

To the mixture for an adult, 10 minims of a 1 : 1,000 platinum chlorid solution are added on the first day, 7.5 minims on the second

day, 5 minims on the third day, also on the fourth day if necessary, and then it is continued in 3 or 5 minim doses until recovery. (*Indian Med. Gaz.;* through *Jour. Amer. Med. Assoc.*, December 6, 1919.)

CORRESPONDENCE.

THE UNIVERSITY OF WISCONSIN,
MADISON.

Editor, AMERICAN JOURNAL OF PHARMACY,
Philadelphia, Pa.

In order to be able to assist one of our students, majoring in art, who is making a special study of pharmaceutical book plates, I take the liberty to ask all persons or associations that have book plates to send specimen copies. Your kind coöperation in publishing this notice, as well as theirs will be greatly appreciated. If librarians and other book lovers who know of such book plates, old as well as new, will kindly advise the writer of their discoveries, it should be possible to make the catalogue of pharmaceutical *ex libris* much more complete than would otherwise be the case. Trusting that this appeal may meet with many a response, I remain

Very truly yours,
EDWARD KREMERS.

BOOK REVIEWS.

SOLUBILITIES OF INORGANIC AND ORGANIC COMPOUNDS. By Atherton Seidell, Ph.D., Hygienic Laboratory, U. S. Public Health Service, Washington, D. C. Second edition, enlarged and revised. $7.50 net. D. Van Nostrand Company, New York.

This is a compilation of quantitative solubility data from the periodical literature gleaned from fifty periodicals during the years 1900 to 1917 inclusive, twenty-three periodicals being searched page by page and the other twenty-seven through tables of contents, and represents the study of about 2600 different substances by more than 1500 investigators. The first edition came out in February, 1907, and a second printing with corrections appeared in

1911. In this edition there were 354 pages of subject matter and $10^1/_2$ pages of index. The present edition (February, 1919) contains 784 pages of body matter, 37 pages of author index and 21 pages of subject index. Most of the body of the book is devoted to tabular arrangements of solubility data, but there are 18 pages of general information explaining the use of the tables and giving reasons for the appearance of some of the data in the book; and there are 28 pages on methods for determining solubilities, with illustrations of the most important of the apparatus described in the text.

The names of the substances for which solubilities are given are arranged alphabetically, the pages and paragraphs being headed in bold-faced type for easy reference. The authority for the data in each instance is given by name of author and year data was published, while in the back of the book are to be found two pages giving the names of the 50 periodicals from which the data were collected, paged so that the original article can be traced easily.

In preparing a review of a book of this character it is difficult to find a place of attack, as the reading of 784 pages, chiefly of tabular matter in rather fine print, is apt to be exceedingly tiresome without "getting one anywhere." Something of the scope of the book may perhaps be gathered from the examination of the data given for a few substances. Taking seven somewhat at random, we find that:

For Quinine (p. 576) the solubility is given in 19 different liquids, in some at 3 different temperatures.

For Radium Emanations (p. 580) the solubility is given in 15 liquids, at 0° C. and at 18° C.

For Carbon Dioxide (p. 234) the solubility is given in 44 different liquids, at 3 different temperatures.

Five pages are devoted to solubilities of Phenol, eight to Ethyl Alcohol, ten to Mercuric Chloride, nine to Iodine, each in a great variety of liquids and under a great variety of conditions. In the case of Iodine (for illustration) the solvents named include water, alcohol, benzene, chloroform, ether, bromoform, carbon disulphide, carbon tetrachloride, aqueous solutions of potassium iodide, mercuric chloride, potassium bromide, sodium chloride, hydrochloric acid and a number of other salts and acids, together with a lot of mixed solvents, each substance being used in various strength solutions.

One who examines the subject matter of the book, even very superficially, cannot help being amazed at the vast amount of work

the determination of the facts recorded therein represents, on the part of the original workers or investigators; nor can he help being impressed with the vast amount of painstaking labor that must have been done by the author of the present volume in its compilation. In the preface the author says: "The principal object in preparing a compilation of solubility data, from the point of view of the advancement of chemistry, is to furnish material for the origination and verification of theories of solution," but one can readily see how this volume may be of great value to anyone whose work has to do with the solubility of substances in various solvents and under varying conditions. F. P. STROUP.

ANNALS OF THE MISSOURI BOTANICAL GARDEN, Vol. 6, No. 3, Sept., 1919.

AN EDIBLE GARDEN HEBELOMA.—E. A. Burt describes and pictures an edible *Hebeloma*, which he found in great abundance in cultivated borders of the Missouri Botanical Garden on June 3rd, and which he names *H. hortense*.

This species differs from the majority of other members of the genus *Hebeloma* in that its fructifications are devoid of viscidity and odor of radishes and its occurrence in abundance in cultivated ground. Nearly all the other species of *Hebeloma* are found sparingly in forests and are either inedible or poisonous.

PROTOMERULIUS FARLOWII.—The same author describes and pictures another fungus which was collected by Dr. Farlow at Chocorua, New Hampshire. This he named "*Protomerulius Farlowii*." Its fructifications occur on rotten, decorticated, coniferous wood in small gregarious patches, each being gelatinous, membranous, very thin and tender, purple when fresh, becoming pale olive-gray on drying, showing under the microscope an imperfectly porose surface with thin, irregular folds and more or less lacerated dissepiments.

THE MICRO-CALORIMETER IN THE INDICATOR METHOD OF HYDROGEN ION DETERMINATION.—B. M. Daggar finds that the Duboscq type of micro-colorimeter lends itself admirably to determining the H ion concentration in small quantities of fluids. The procedure is briefly described and the method of standardizing the apparatus carefully explained.

STUDIES IN THE PHYSIOLOGY OF THE FUNGI. VIII. MIXED CULTURES. By S. M. Zeller and Henry Schmitz.—The authors discusss the behavior of the following fungi in mixed cultures: *Lenzites vialis, Merulius pinastri, Daedalea quercina, Trametes Peckii, Pleurotus sapidus, Merulius lacrymans, Lentinus lepideus, Daedalia confragosa, Coniophora cerebella, Polystictus versicolor, Isaria* sp., *Polyporus lucidus, Polystictus hirsutus, Aspergillus glaucus, A. niger, A. fumigatus, A. versicolor* and *A. Sydowi*. A number of combinations were used and the results indicated in two tables. A plate of 12 figures, illustrating the nature of combination growths in culture media accompanies the article.

STUDIES IN THE PHYSIOLOGY OF THE FUNGI. IX. ENZYME ACTION IN *Armillaria Mellea* Vahl, *Daedalia Confragosa* (Bolt. Fr., and *Polyporus Lucidus* (Leys.) Fr. By Henry Schmitz and Sanford M. Zeller.—In this article the authors discuss the enzyme activities of the fungi indicated. In *Polyporus lucidus* the presence of the following enzymes is demonstrated: Esterase, maltase, lactase, sucrase, raffinase, diastase, inulase, cellulase, hemicellulase, emulsin, tannase, urease, and trypsin and erepsin, when fibrin is used as a substrate.

In *Armillaria mellea* the presence of the following enzymes is shown: Maltase, lactase, sucrase, raffinase, diastase, inulase, cellulase, hemicellulase, emulsin, urease, amidase, and trypsin and erepsin, when fibrin is used as a substrate.

In *Daedalia confragosa* the following ferments are present: Esterase, maltase, lactase, sucrase, raffinase, diastase, inulase, cellulase, hemicellulase, emulsin, tannase, urease, and trypsin and erepsin, when fibrin is used as a substrate.

A new method for the determination of ammonia liberated by amidase is described.

STUDIES IN THE PHYSIOLOGY OF THE FUNGI. X. GERMINATION OF THE SPORES OF CERTAIN FUNGI IN RELATION TO HYDROGEN ION CONCENTRATION. By R. W. Webb.—The author reviews the literature bearing on this problem and then discusses the methods he followed in determining the effect of hydrogen ion concentration upon the rate of germination of the spores of certain fungi and the range within which most favorable germination occurs. He draws the following conclusions:

(1) In a culture solution consisting of M/5 mannite, phosphoric

acid, and sodium hydroxide, successively increasing concentrations of hydrogen ions from neutral or approximately neutral to PH. 3.1–2.8 favorably influence germination of the spores of *Aspergillus niger*, *Penicillium cyclopium*, *Botrytis cinerea*, *Fusarium* sp., and *Lenzites saepiaria*.

(2) The range of germination and the magnitude of the germination quantities as influenced by hydrogen ion concentration in the solution depend upon the organism, germination being obtained with the following concentrations, inclusive: *Aspergillus niger*, PH. 2.8–8.8; *Penicillium cyclopium*, 2.9–10.0+; *Botrytis cinerea*, 2.8–7.0; *Fusarium* sp., 2.8–10.0+; and *Lenzites saepiaria*, 2.8–7.0.

(3) It is not until a hydrogen ion concentration of PH. 2.8 or above is reached that inhibition of germination of the forms studied is noticed.

(4) *Aspergillus niger*, *Penicillium cyclopium*, *Botrytis cinerea* and *Lenzites saepiaria* show a maximum of germination in the medium employed at PH. 2.8–3.1; *Fusarium* sp. exhibit a secondary maximum at this concentration.

(5) *Fusarium* sp. give a pronounced maximum of germination at PH. 7.4 and *Penicillium cyclopium* exhibit a minor secondary maximum at PH. 7.0–7.4.

(6) For equal removes from the neutral point, OH ions appear to be relatively more toxic to the spores studied than H ions.

(7) With increase in length of intervals of incubation, the relations of germination to hydrogen ion concentration remain practically the same.

(8) The curves of germination for any organism are practically identical, whether incubated at 22° C., 27° C., or 31° C.

HEBER W. YOUNGKEN.

A CRITICAL REVISION OF THE GENUS EUCALYPTUS. By J. H. Maiden, I.S.O., F.R.S., F.I.S. Vol. IV, Part 8.

The part of this comprehensive monograph on the Genus Eucalyptus that is now before us continues this work along the lines of the preceding parts. The same high-class illustrations are likewise continued. It presents descriptions of the following species:

Eucalyptus tessellaris F.v.M; *E. Spenceriana* Maiden; *E. Cliftoniana* W. V. Fitzgerald; *E. setosa* Schauer; *E. ferruginea* Schauer;

E. Moorei Maiden and Cambage; *E. dumosa* A. Cunn; *E. torquata* Luehmann; *E. amygdalina* Labill; *E. radiata* Sieber; *E. numerosa* Maiden; *E. nitida* Hook. f.

Bulletins of the University of Wisconsin.

It is a pleasure to review the two bulletins of the University of Wisconsin that have recently come to hand.

The first of these bulletins is a study of the Galenical Oleoresins, by Andrew G. Du Mez, and is a thesis submitted for the degree of Doctor of Philosophy at the University of Wisconsin. The history and bibliography of this class of preparations has been very carefully compiled. A review of the work done by various investigators on each of the official oleoresins is thus brought together and compared in the various tables. In addition to the bibliographic study involved by this comprehensive review of the subject covering 288 pages, there is considerable original investigations of the various methods proposed for the manufacture of oleoresins and the chemistry of the individual preparations. It exhibits a high type of study and research work and demonstrates that the research spirit in pharmacy in America in not inactive. Furthermore, that the Department of Pharmacy of the University of Wisconsin and several more of the schools of pharmacy are stimulating the research spirit by requiring thesis contributions for degrees in course. This is an example which might well be followed at least by all schools claiming to educate in the higher courses in pharmacy.

It is regretted that the space at our command will not permit of the reprinting of abstracts of this valuable thesis which should be read by all interested in the development of pharmacy and its literature and preserved as a work of reference on this subject.

The second of these bulletins is a thesis by Nellie A. Wakeman, likewise submitted for a degree at the University of Wisconsin. It is upon the subject of "Pigments of Flowering Plants." The subject of pigmentation in plants is one that is of especial interest to both chemists and botanists. The author of this thesis, under the guidance of Prof. Edward Kremers, has also performed a valuable service in presenting this comprehensive bibliographic study of such an interesting subject. Numerous structural and graphic formulas are given, illustrating the chemical composition of the various organic com-

pounds producing the colors in vegetation. It likewise is a most commendable and valuable contribution to our literature.

G. M. B.